DEFENSE INDUSTRY BULLETIN

Volume 1 No 12 December 1965

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IN THIS ISSUE

The Army's Accent on Seeing 1
Two-Step Formal Advertising 3
AFSC Electronic Systems Division Command-Control-Communications 4
Equipment Readiness: an Achilles Heel 9
The Navy Resale System 14

DEPARTMENTS

About People 7
Notes for Editors 10
Speakers Calendar 13
From the Speakers Rostrum 17
Bibliography 20
Meetings and Symposia 21
Calendar of Events 22
Defense Procurement 26

DEPARTMENT OF DEFENSE

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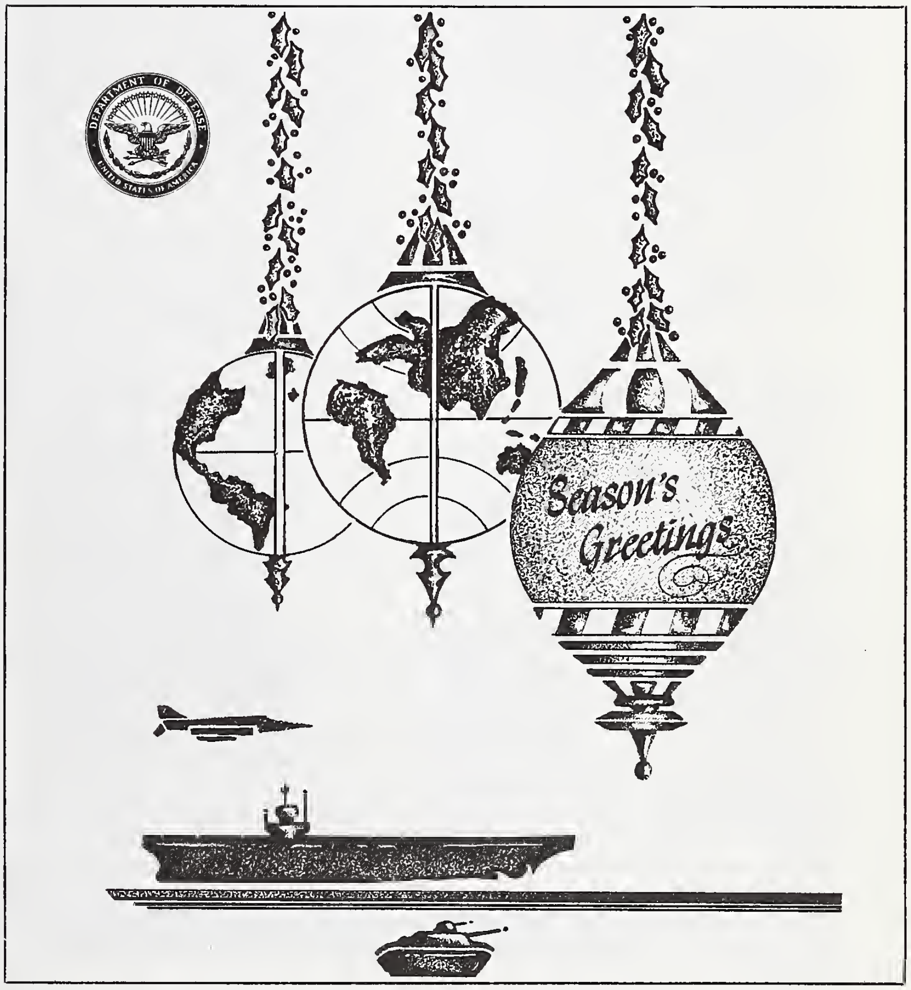

Navy Adopts New Contracting Procedure for Ship Building

The Secretary of Defense has approved plans for the trial application of a new contracting procedure in ship construction. This procedure will be comparable to the "total package" concept used in procurement of the Air Force C–5A heavy transport aircraft.

The new Fast Deployment Logistics Ship (FDL) has been chosen as the prototype for testing the new concept. It is to be a large fast vessel, equipped with lighters and on-board helicopters for off-loading where there are no port facilities. Its primary mission is the rapid deployment of ground force equipment in an emergency.

The new construction plan involves a single contract for the design, construction and certain support functions of a number of ships of the same type. Substantial savings and increased efficiency are foreseen.

The Navy will select a design and production proposal for the FDL program on the basis of cost and performance, covering an appropriate portion of the total life cycle. Heretofore, contracts have covered ship construction only.

Qualified firms will submit design and production proposals against Navy performance and reliability standards.

Thus, the Navy will place a premium on resourcefulness and ingenuity in engineering and design. There will be no specification by the Navy of detailed ship characteristics or of materials to be used. Instead, bidders will be required to include specific guarantees of overall cost and performance.

Only those firms competing for the production contract will be permitted to compete for the design contract. This will insure that design proposals are technically feasible and that cost figures are responsible.

Project Manager for the FDL is Rear Admiral Nathan Sonenshein.

Technical Thesaurus Planned by DOD to Broaden Information Exchange

Compilation of a technical thesaurus for use in communication among Department of Defense activities has been started by Dr. John S. Foster, Jr., Director of Defense Research and Engineering.

Known as Project LEX, this task is a major phase of DOD's current program to broaden effective exchange of technical information. Automation has emphasized the need for words and terms that express concepts of units of information. Equally important is a guide to these terms. Project LEX seeks to fill this need with the thesaurus approach.

Scientific and technical terms will be gathered from all phases of DOD activities. The compilers will also take into consideration technical terminology from related professional groups, other Government activities, industry and educational institutions.

The Office of Naval Research, which is responsible for preparation of the thesaurus,has created a 14-man project task force to accomplish the task. Represented on the task force are the three Military Departments, the Defense Documentation Center, the National Security Agency and the Defense Intelligence Agency. J. Heston Heald, of Dr. Foster's Office of Technical Information, is project director.

A 15-month work schedule is planned and publication by the Government Printing Office is expected before the close of FY 1967.

DEFENSE INDUSTRY
BULLETIN

Published by the Department of Defense

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The *Defense Industry Bulletin* is published monthly by the Business & Labor Division, Directorate for Community Relations, Office of the Assistant Secretary of Defense (Public Affairs). Use of funds for printing this publication was approved by the Director of the Bureau of the Budget.

The purpose of the *Bulletin* is to serve as a means of communication between the Department of Defense (DOD) and its authorized agencies and defense contractors and other business interests. It will serve as a guide to industry concerning official policies, programs and projects, and will seek to stimulate thought by members of the defense-industry team in solving the problems that may arise in fulfilling the requirements of the DOD.

Material in the *Bulletin* is selected to supply pertinent unclassified data of interest to the business community. Suggestions from industry representatives for topics to be covered in future issues should be forwarded to the Business & Labor Division.

The *Bulletin* is distributed each month to the agencies of Department of Defense, Army, Navy, and Air Force, and to representatives of industry. Request for copies should be addressed to the Business & Labor Division, OASD/PA, Room 2E813, The Pentagon, Washington, D.C. 20301, telephone, OXford 5–2709.

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The Army's Accent on Seeing

by

Lt. Gen. William W. Dick, Jr., USA

It has been said that an Army travels on its stomach, but to be an effective force a military unit must also have good eyes to carry out its mission.

For this valuable asset, the U.S. Army relies heavily on American industry.

Heading the list of the Army's optical requirements is the very obvious field of fire control instruments without which most weapons would be ineffective. Still another area of need is that of combat surveillance and target acquisition. This covers a wide range of effort—from vastly improved photographic lenses to totally new types of night vision devices. And, with maturity of nuclear weapons, there is the future requirement for protective devices for the eyes of tomorrow's military man.

Eye Glasses and the Combat Soldier.

The basic asset of any army is the individual combat soldier. Today he must be prepared to operate effectively, on very short notice, in any climate from soggy, humid jungles, to deserts, to the snows and tundra of the Arctic. His ability to see is the *sine quo non* of his ability to be an effective soldier.

For example, take the present day situation in which U.S. troops are conducting search and clear operations in Vietnam. Any impairment in the ability of these troops to see—no matter what the degree or the length of time—reduces their effectiveness. Consider this premise in the light of the fact that over one-third of the men in today's active Army wear prescription eye glasses, and that of this number almost 40 per cent require annual replacement.

Now, to carry the problem a bit further, Fort Hood, Tex., is the home of two of the Army's combat ready divisions—the First and Second Armored Divisions. The U.S. Army Hospital at Fort Hood, over a recent six-month period, was called on to repair or replace 800 sets of eyeglasses per month. This figure reflects a replacement and repair rate for units in training; however, under the greatly increased hazards of actual combat operations this rate accelerates greatly. What makes this so important to the Army is that in the past, and even today, soldiers who lose or break both pair of their glasses are actually evacuated from the combat area, and they are then *de facto* battle casualties until new sets can be fabricated by the medical optical shop. The time lost here is hard to compute, but it is estimated that with today's methods about three hours is required to pre-grind, pre-polish, cut, edge and insert spectacle lenses, to say nothing of the time required to remove the soldier to the rear, process him and return him to his unit.

So, the Army has need for a device or system which will provide a rapid automatic means for fabricating eyeglasses. Not only is it important to reduce the amount of time lost, but it is hoped that the entire process can be simplified, thereby reducing the training time of technicians as well as cutting down the logistical aspects by dispensing with the need for carrying about some 800 pre-ground prescription lenses. Ultimately, what the Army would like to have is a unit capable of quickly fabricating—say in about 10 minutes—any desired lens from a single, non-segmented, non-foci source of optical material. Hopefully, this unit could be of a size and weight capable of being moved about in a ¼-ton trailer or truck bed.

Protection Against Flash Blindness.

Today's and tomorrow's battlefield poses a number of problems which never concerned the soldier of the past. The most obvious is the nuclear weapon, with its radiation, blast and thermal effects. A side factor, however, and one sometimes overlooked, is that such weapons are also capable of putting out of action a soldier who has survived all the effects of the three major forces of radiation, blast and heat. A soldier outside the effective range of these forces may still become a casualty through flash blindness. The effects of flash blindness, though temporary, may last from less than a second to more than 30 minutes. And, of course, there is the permanent type of retinal damage—chorioretinal burn. Therefore, a soldier who cannot see to carry out his mission is just as much a casualty as one who has suffered serious burns, blast damage, or ionizing radiation.

Lt. Gen. William W. Dick, Jr., is Chief of Research and Development, Department of the Army. In this position he is responsible for the Army's entire research and development program. He held prior assignments in OCRD as Dep. Chief and as Dir. of Special Weapons.

As a result, the Army—along with the other Services—is avidly seeking a solution to the problem of preventing flash blindness and retinal burn. Our approach follows two basic courses. One entails the use of a protective system or device such as glasses or goggles to attenuate or reflect oncoming energy. The second involves modifying the eye's response—either by pharmacological means or by human engineering design of instruments, so that visual impairment is either obviated or mitigated. In the first of these, for example, we would hope that a device or system can be developed which will be normally optically transparent, but which, on activation by the first pulse of a nuclear detonation, will "close" or darken to a transmittance of 0.01 per cent or less in 50 microseconds. Then, when the pulse has ended, the device will open immediately so that normal vision is instantly restored.

We have been working on this, as a matter of fact, for about five years now. Our first efforts were with reversible organic phototropic materials. Organic solution systems were developed which achieved the required optical density in the desired amount of time, but they darkened under normal daylight. Still other approaches were tried but were not found to be feasible. Recently, a number of new phototropic dyes were synthesized by one of our contractors and their transmittance characteristics determined. Of these, 11 showed one or more strong absorbtion bands in the 400 to 800 millimicrons. Under tests it has been found that reaction in these polymethines is initiated in less than 40 nanoseconds and can produce an optical density of 3.8 in 100 microseconds. We have also been working on phototropic thiazines hoping to come up with an eventual solution to this vexing problem.

Visual Problems of the Helicopter Pilots.

Moving to another new problem area, today's Army has a greater need for rapid tactical mobility than ever before. Two factors have brought this to pass: the incredible increase in modern weapon effectiveness, and the nature of today's and tomorrow's battlefield. In the first case, a real threat of annihilation awaits a unit which stays long in one spot in the face of modern firepower; and, in the second case, because of the communist technique of what they call "wars of liberation" with primary reliance on guerrilla action such as we are seeing in Vietnam, speed in movement is essential in combatting this type foe.

The Army is now meeting this demand for greatly increased tactical mobility to a great extent through aerial vehicles. Last June an air mobile division was activated at Fort Benning, Ga. This new and completely unique type organization to the Army will have over 430 aircraft assigned to it—mostly helicopters. Even in today's conventional infantry division there are approximately 100 aircraft. This is an example of changing tactics in the Army which are bringing forward new problem areas.

The case in point is that, while greater reliance is being placed on helicopters, it is suspected that helicopter pilots may experience what scientists call "extreme electroencephlographic photic action." The effects of this are dizziness, disorientation and even nausea which can occur in a pilot from the rotating helicopter blades. The effect is similar to the flashing light of a stroboscope. The intermittent light flashes may produce a photic driving effect in a few sensitive individuals and this, in turn, evokes the dizziness and confusion. This subject is under study to determine if it is a serious issue for helicopter pilots in flight.

In this same area, helicopter pilots in Vietnam have asked for assistance in solving a helmet shield problem they have experienced. Pilots use a clear plastic face shield to provide protection against flying fragments from small arms fire. This plastic shield develops numerous small scratches that obstruct the visual field. A more resistant plastic and a scratch-removing polish are required to solve this practical need.

Because of an increasing demand for aviation personnel, the Army is also studying the possibility of revising its color vision testing methods as well as standards for acceptance.

Normal color vision has historically been an intrinsic part of the physical standards maintained for military and civilian aviators and aircrew members. Until recently this requirement has been accepted without challenge due to the abundant number of applicants versus the number of positions available. Today, this is no longer the case.

So, when we looked at our rejection statistics, we found that about 50 per cent of those who are rejected are rejected because of visual defects. In view of the percentage of the male population known to be affected by imperfect color vision, this requirement alone appears to contribute significantly to the number of applicants rejected. It becomes obvious, then, that an easement of this standard could result in a larger number of otherwise qualified men, particularly if it is found that an aviator's lack of color vision—in today's electronic era—does not impede flight safety and his ability to carry out his mission.

Therefore, we believe that there is a need for a color vision standard and test methodology that is more closely related to flight safety and mission accomplishment.

Eye Armor.

Closely allied to the helicopter pilot problem is one involving the protection of the combat soldier. It was found that during World War II almost eight per cent of all aircrew casualties were caused by secondary fragments. Of these, plexiglass fragments were a major cause, particularly because of the vulnerability of the human eye to tiny fragments of this type. With the large number of aircrewmen foreseen for tomorrow's Army as well as the number of ground combat men who will be riding in aerial vehicles, this threat takes on new urgency.

It has been estimated by Army opthamalogists that over 50 per cent of Army eye injuries in battle could have been prevented by eye armor. To that end research was started in 1954 on ballistic susceptibility of eyes and lenses to various types of small high velocity missiles. The work is still continuing. We are attempting to learn precisely what happens to the eye when it is struck by such things, to test various types of protective materials and to determine the results of the two in combination. It has been learned, for example, that the unshielded eye in certain cases may provide itself better protection against impact by missiles below the eye's ballistic limit than can be obtained from some lenses. However, the results here may well be minor corneal contusions or internal structural damage. In effect, an inexpensive simple form of eye armor for the soldier of the future is definitely being sought.

Accuracy Through Fire Control Instrumentation.

Up to this point concentration has been placed on the problems facing the Army in regard to the "seeing" capability of the individual. Let's assume these problems have been solved. We have a soldier with 20/20 vision whose eyes are protected from small missiles, flash blindness and retinal burn. Now, we hand him a highly lethal weapon with a range capability upwards of a mile. For some of the weapons he will receive, his regular, unmagnified vision will suffice, but for others he will require the assistance of fire control instruments if his weapon is to be effective.

The growth of fire control instrumentation and the concurrent growth of optical components is yet another area where the Army has mounting requirements. Whereas the total World War I purchase of military optical items amounted to something like $65 million, our World War II effort used about $100 million per year—five times as much in both raw glass and finished instruments.

By the time of the Korean conflict, there was no real glass shortage and the manufacturing base proved adequate. Today we believe that we are far better prepared—in terms of having a ready base upon which to expand, and better prepared in the sense that we will have instruments which will be technologically superior to those of any potential enemy. But the challenge is great. Accuracy has always been a high requirement for battle success, but the need to achieve accuracy on the future battlefield is even greater. Many targets will be moving at high rates of speed, they will be fired upon at greater ranges, and the high cost of the missile or projectile, coupled with the potentially disastrous results of a miss, require not only a first round hit but a first round kill.

One of the Army's new anti-tank weapons currently under development is an example. Should the Army in the next decade become involved in ground combat operations in Western Europe, we will face an enemy which features large armored forces. To offset this numerical superiority the U.S. will field greatly superior tanks of its own plus a new family of anti-tank weapons which will prove capable of defeating any known tank currently in operation or foreseen for the 1970 decade. One such weapon is the TOW (Tube launched, Optically automatically tracked, and Wire guided). This weapon will employ a guided missile using an improved con-

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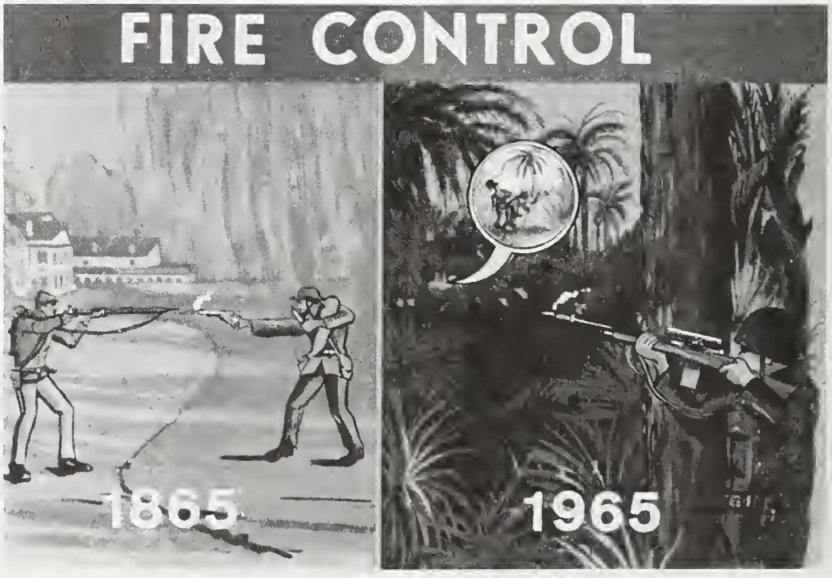

Two-Step Formal Advertising in the Navy

by

RAdm. J. J. Appleby, SC, USN

Naval power has long been associated with the concept of flexibility, the characteristic that permits the United States to respond effectively to an infinite variety of critical situations all over the world.

But the flexibility of naval forces that is so important to our defense posture didn't just happen. It is the product of the dynamic outlook of imaginative men—men who have taken new developments and discovered new ways to use them at sea.

This dynamic attitude permeates the entire Naval Establishment and all phases of its operations and support fuctions.

In the concept of two-step formal advertising, Navy men have seen a new development that adds another measure of flexibility to the procurement process. And they have enthusiastically applied this technique in a characteristic manner.

The rules of formal advertising are well known among companies that do business with Uncle Sam. Basically they are simple: whenever we have sufficient time and firm specifications, the contract goes to the competitor who offers the Government the best price and who has the know-how and capacity to produce what we need.

Yet, most negotiation situations are fully as competitive as any formally advertised transaction. What is lacking are specifications firm enough to make an award primarily based on price. In a large number of cases the specifications, while not always as clear cut as required for the one-shot formal advertising procedure, were not so vague or complex as to preclude clarification by the simple expedient of discussions between the contracting officer and interested suppliers.

It was to provide a means for such clarification, without prejudice to other bidders, that gave rise to this approach to procurement. In a sense, two-step formal advertising stands somewhere in between conventional formal advertising and negotiation. What it does, in effect, is to separate the question of what is being bought—i.e., whether an offerer demonstrates a satisfactory understanding of and a sound approach toward fulfilling the requirement—from the question of how much money is involved and the capacity of a company to produce it. In short, step one determines the responsiveness of a bidder to the terms of the requirement. Is he technically capable of making what is required? Are there some questions about the specifications that can be cleared up without prejudice to the others? Should he bid, considering the delivery and performance requirements?

These are the kinds of questions that are resolved in the first step, and not one word is uttered at this point about price, credit, or capacity. The idea is to get everybody lined up who actually has the technical know-how to do the job, to eliminate those who cannot and to be sure everybody understands what the Government wants. Aside from the benefits to all competitors, it gives the Government a chance to avert the "buying-in" practice. We can be sure that whoever is low bidder is able to deliver the goods—from a technical standpoint.

It is at the second step, then, that we play the game of "showdown." Only those players that have shown that they are technically able to produce what is required are still in the game. The rules are that the price offered in step two must be based on the technical proposal accepted by the Government in step one. The responsible bidder with the lowest price is declared the winner.

What you have just read is a good thumbnail sketch of this innovation in the purchasing process. But if you are interested in doing more business with the Government, read on, because the use of two-step formal advertising is increasing rapidly. As a matter of fact, its use in the Navy has almost doubled in the past two years—from $46 million in FY 1964 to $87 million in FY 1965. That seems to be a pretty good reason for taking a closer look at two-step!

Before reaching into his bag of purchasing procedures, the Navy contracting officer considers the nature of the item required and the conditions of the market in which it will be purchased. If it looks like he could use conventional formal advertising except for a lack of definitive specifications, two-step formal advertising may be the answer. But there are other preconditions to using this approach. At this point he needs help from the technical side of the house.

RAdm. Jack J. Appleby, SC, USN, serves as Deputy Chief of Naval Material (Material and Facilities) and is a veteran of 27 years naval service. Prior to assuming his present assignment on April 7, 1965, Adm. Appleby served as Executive Officer of the Aviation Supply Office, Philadelphia, from 1958–1960 and as Commanding Officer, Navy Ship's Store Office, Brooklyn, N.Y., from 1960–1965.

The contracting/technical team must establish that they have definite criteria or standards by which they can evaluate technical proposals. They take a look at the market and assure themselves, insofar as possible, that more than one technically qualified source is available.

Finally, the contracting officer must determine that the date the material is required allows enough time for the use of two-step and that a firm fixed-price contract (with or without escalation) can be awarded.

Given these conditions, the time has arrived for the preparation of the solicitation document—the most critical phase of any buy. In two-step formal advertising, the solicitation document is called a "request for technical proposal."

Here is where the lines of buying influence from the technicians are particularly apparent. In two-step, the contracting officer calls on the technician's specialized knowledge for much of the substance of the request for technical proposal.

This solicitation document provides the prospective bidder with the best practicable description of what the Government wants. It tells him what the Government needs in terms of drawings, data, presentations, etc.

You won't have to guess at how the Government will evaluate your technical proposal — the criteria to be used in the evaluation of proposals is included in the solicitation document. Although delivery and performance requirements are not items for evaluation in step one, a forthcoming change to the Armed Services Procurement Regulation will provide that information about them may be included in the solicitation documents to help prospective bidders decide whether or not they want to submit a technical proposal.

With the completion of the request for technical proposal, the Government is ready to enter the market; the solicitation is mailed to qualified bidders and is synopzied in the *Commerce Business Daily.*

The technical/contracting team is now back in session evaluating technical proposals received in response to the solicitation. Which engineering approaches are feasible? Will the proposed special manufacturing processes produce what we need? Which special testing techniques will tell us what we want to know? What are the latest developments in the market?

The answers to these questions may

(Continued on Page 25)

AFSC Electronic Systems Division Command-Control-Communications

by

Maj. Gen. John W. O'Neill, USAF
Commander, Electronic Systems Division
Air Force Systems Command

In the July issue of the *Bulletin*, Lieutenant General W. A. Davis, Vice Commander of the Air Force Systems Command (AFSC), explained AFSC's mission and organization. Stating that the Electronic Systems Division (ESD) is one of the four AFSC product divisions in which contractors have their primary interest, General Davis succinctly defined our role as follows:

> **"The Electronic Systems Division is responsible for development, acquisition and delivery of electronic systems and equipment for command and control of aerospace forces. This includes ground-based warning, aerospace support systems, satellite tracking and ground assessment of objects in space."**

ESD is the major development and procurement agency for electronic information and communications systems for the Air Force and for such unified and specified commands as the North American Air Defense Command (NORAD), Strategic Air Command (SAC) and U.S. Strike Command (USSTRICOM). Space does not permit discussion of the 29 major programs and scores of lesser but important projects which we are currently pursuing. Later, I'll mention a few representative ones.

As General Davis pointed out, one measure of the importance of our product is our budget of over $314 million of FY 1966 alone. With more than 10,000 people in the Hanscom complex located near Bedford, Mass:—4,300 in ESD itself—we are also a world-wide organization installing systems and equipment or providing support to improve global command-control-communications at over 900 sites. We have established five detachments and many field offices in such places as Wiesbaden, London, Paris, Rome, Athens, Ankara, Tokyo, Manila and many other locations. With this world-wide organization ESD is working hard to provide the kind of military command and control capability which the late President Kennedy envisaged in 1961 and which President Johnson and Secretary McNamara continue to regard as vital to implement national policy.

While ESD is naturally proud to be the primary organization for the development and acquisition of command control systems for the Air Force and for several unified and specified commands, we do not establish all such requirements for the entire Air Force. It would be presumptuous for us to attempt to tell the commander of a major (unified or specified) command what he needs to know to be able to exercise his command and control responsibilities effectively. On the other hand, the commander cannot possibly keep up with the technology which might be applied to his problems. So, in practice, the using commands plan their own tentative requirements based on such factors as force structures, mission and operational concepts. We are called in during early planning stages for analytical and technical inputs. Once a commander is satisfied that a plan will meet his foreseeable requirements, ESD takes over to develop the system.

Experience has taught us that system growth should be evolutionary and that each system must be tailored to the user's particular needs. Accordingly, ESD has to maintain a continuing close relationship with the users. More and more we are finding it necessary to move people into the field so we can be truly responsive to a combat commander's needs. For example, we have a technical group at Omaha with SAC on the Strategic Air Command Control System. In like manner we have ESD people stationed at Cheyenne Mountain with the 425L NORAD Operations Center and at U.S. Strike Command headquarters with the 492L USSTRICOM Command and Control System.

Recently we have been selecting people to work with users to identify systems before development begins. We have already done this for a command and control system for the Military Air Transport Service (MATS) and for an Advanced Tactical System.

Before mentioning specifically what ESD does, it might be well to define our end product: an L (M or N) system is a composite of equipment, skills and techniques capable of supporting an operational role. A complete system includes related facilities, equipment, material, services and personnel required for its operation to the degree that it may be considered a self-sufficient unit in its intended support environment. Because many persons find it difficult to categorize our projects, I believe it may help if I discuss some of them according to the ESD organizational arrangement. As I indicated earlier, space does not permit a detailed listing of all of our many projects. Neither shall I discuss every block of our organizational chart.

Essentially we have three mission deputates under which virtually all of our hardware-oriented projects fall. These are the deputates with which industry is primarily concerned. In short, their business is to translate a firm requirement into an operational system.

One of the most representative important projects of the Deputy for Command Systems is the 473L Headquarters Command and Control System. Now being installed in the Pentagon, this highly complex system will provide information on Air Force operations and resources to support de-

Typical of the far-flung communications programs managed by the AFSC Electronic Systems Division is this tropospheric scatter site constructed in Spain. The modern functional steelwork of the "billboard" size antennas provides a stark contrast to the ancient town in the background.

cision making in the face of rapidly developing contingencies of an operational nature. While a version of the 473L system is actually in operation at the Air Force Command Post, a new data processing subsystem will provide a step forward in speed and capability. Improved techniques and equipment are gradually being phased into operation.

On March 1 of this year we turned over to the Commander-in-Chief of SAC the 465L Strategic Air Command Control System. Basically, this is a huge two-way system sending information into SAC headquarters and sending operational instructions and commands outward to the SAC force. Now being tested operationally by SAC, the 465L system should give the SAC Commander in Chief a more advanced, much faster method of managing weapons and equipment as well as the means to exert positive control, in even greater depth, over his command.

I've used these two systems to indicate the type of thing we do in this area. While the purposes of command systems are similar, each of the many systems under development py ESD varies considerably from all others both in terms of hardware and software.

While industry is interested primarily in our hardware, I must add that a system does not become a system until the hardware is energized by software. We use this term to include all of the information which a given system must process, plus the set of instructions (computer program) which must be given to the computer so it can handle the information accurately and promptly. And it must include the set of instructions (methods and procedures) which the human operators of the system need to make the hardware and the computer program do what they are supposed to do. Though I shall confine the remainder of this article to hardware, I want to make clear that we are equally concerned with software.

Our Deputate for Surveillance and Control Systems is perhaps best known for the development of the SAGE and BMEWS systems which have been well described in news media. Much newer than SAGE is the 416M Backup Interceptor Control System (BUIC). BUIC facilities are high speed, computerized control centers which will furnish air defense commanders with up-to-the-minute information on any airborne threats. Each center is really a small direction center which, thanks to technical advances, is capable of controlling all air operations in an air defense sector. Within each sector one or more BUIC centers will be located outside of probable target areas. The intent is to provide a survivable semi-automatic defense system by dispersing facilities widely. On September 1, 1965, we turned over to the Air Defense Command the first operational BUIC facility at North Truro, Mass.

Because of the world situation, the role of tactical airpower has become increasingly important. ESD has recently established an Office of Assistant for Limited War. Other ESD elements have been reorganizing to respond to the Southeast Asian crisis. Typical of our efforts in this area is the 407L Tactical Air Control System. Into one air transportable system we are packaging all mobile communications and electronics systems needed for command and control of tactical aerospace operations. Phase I of this program, which began in FY 1965, concentrated on the procurement of equipment to meet the critical deficiencies of tactical operations. This equipment was procured off the shelf or with minimum engineering. Today, in Phase II of this program, we are evolving a systems plan to provide an improved operational capability for tactical forces in the 1968 to 1970 period.

Even before we complete this project we are looking forward to advanced tactical systems. Our planning efforts are directed to such questions as "How can we best detect low-flying aircraft?" and "How can we furnish real-time response to requirements for close air support?" These questions are also the basis for proposed industrial planning study efforts of the next several months.

During the two years since its establishment, the Deputate for Communications Systems has acquired an extensive communications program whose products have been developed for the Defense Communications Agency, for the Air Force and for other elements of the Defense Department. Perhaps the most extensive of these is the 486L European-Mediterranean Tropospheric Scatter System which now includes some 100 sites located in five European countries stretching from Turkey to England.

Industry is also concerned with two other ESD deputates which support the hardware-oriented ones I've just discussed. The Deputy for Engineering and Technology relates new theories and discoveries with our military command-control-communications requirements. By identifying and pushing the state of the art, this deputate provides engineering and technical support to other ESD mission elements.

With an eye always to the future, the Deputy for Advanced Planning devises or considers what form a system may take or what our requirements might be from 10 to 20 years ahead. This responsibility requires conceptual, feasibility and cost studies of the next generation of systems.

This has been only a brief summary of some of ESD's projects. Ahead lie many challenges—challenges for which industry can suggest new developmental and acquisition possibilities. Through a partnership of industry and ESD, new military capabilities can be provided to the combat forces—capabilities vital to implement national policy.

Minimum Wage Law Set for Service Contracts

The Service Contract Act of 1965 (McNamara-O'Hara Act), P.L. 89-286, will become effective on or about Jan. 22, 1966, and will be reflected in appropriate DOD service contracts thereafter.

In essence the law provides for payment of the Fair Labor Standards Act rate or, when so determined by the Secretary of Labor, the prevailing rate (including fringe benefits), whichever is greater, to employees working on a Government contract for services.

Contracts covered will be those in excess of $2,500, the principal purpose of which is to furnish services in the United States through the use of employees such as guards, watchmen, and any person engaged in a recognized trade or craft, or other skilled mechanical craft, or in unskilled, semi-skilled, or skilled manual labor occupations. Although the act clearly includes contracts for laundry, custodial, guard, food and miscellaneous housekeeping services, other service contracts may also be subject to it.

The overall scope of the act will be determined by regulations and interpretations of the Department of Labor which is charged with its administration and enforcement.

NORAD To Occupy New Underground Ops Center Jan. 1, 1966

The North American Air Defense Command (NORAD) plans to celebrate the new year by taking over its new combat operations center being built inside a mountain near Colorado Springs, Colo.

January 1 is the date set for initial operational capability of the underground aerospace defense command post and for NORAD to take over from the builders and developers.

The command's present combat operations center, hub of a continental network of detection and warning devices backed by defensive interceptor fighters and missiles, is an aboveground block structure at Ent AFB, Colo.

It will remain in operation at least until full operational capability of the facility inside the mountain is achieved.

In the caverns, 11 steel buildings, most of them three stories high, have been constructed, and all are mounted on huge springs to protect sensitive equipment against nuclear blasts.

The buildings will house the equipment to receive, process and display information on the air and space traffic picture over North America, and the people who will evaluate the findings and sound the first warning in case of attack.

Top 100 Defense Contractors FY 1965

The 100 companies which together with their subsidiaries received the largest dollar volume of military prime contracts of $10,000 or more in FY 1965 accounted for 68.9% of the United States total. This was 4.5 percentage points below the 73.4% obtained by the top 100 companies in FY 1964.

The FY 1965 decline in the 100 company percentage resulted mainly from a decrease of $1.6 billion in missile and aircraft contracts which generally are awarded to very large concerns, since they have the resources and know-how to undertake complex large scale projects. As a corollary of the reduction in aircraft and missile prime contracts, the percentage of all prime contracts awarded to small business increased from 18% in FY 1964 to 20.3% in FY 1965. Small business firms also obtained about 40% of the total amount of subcontracts placed by large concerns. Over the past 10 years large companies have subcontracted out approximately one-half of their defense work.

1. Lockheed Aircraft Corp.
2. General Dynamics Corp.
3. McDonnell Aircraft Corp.
4. General Electric Co.
5. North American Aviation, Inc.
6. United Aircraft Corp.
7. American Telephone & Telegraph Co.
8. The Boeing Co.
9. Grumman Aircraft Engineering Corp.
10. Sperry Rand Corp.
11. Martin-Marietta Corp.
12. Ford Motor Co.
13. General Tire & Rubber Co.
14. Raytheon Co.
15. Hughes Aircraft Co.
16. Ling-Temco-Vought, Inc.
17. Westinghouse Electric Corp.
18. Northrop Corp.
19. General Motors Corp.
20. Bendix Corp.
21. Avco Corp.
22. General Telephone & Electronics Corp.
23. Kaiser Industries Corp.
24. Radio Corp. of America
25. International Telephone & Telegraph Corp.
26. Todd Shipyards Corp.
27. Textron, Inc.
28. Litton Industries, Inc.
29. I.B.M. Corp.
30. Newport News Shipbuilding & Dry Dock Co.
31. Douglas Aircraft Co., Inc.
32. Standard Oil Co. (New Jersey)
33. Pan American World Airways, Inc.
34. Collins Radio Corp.
35. Thiokol Chemical Corp.
36. Texaco, Inc.
37. F M C Corp.
38. Massachusetts Institute of Technology.
39. Standard Oil Co. (California)
40. Hercules Powder Co.
41. General Precision Equipment Corp.
42. Socony Mobil Oil Co.
43. Goodyear Tire & Rubber Co.
44. Honeywell, Inc.
45. Ogden Corp.
46. Chrysler Corp.
47. T R W, Inc.
48. Aerospace Corp.
49. Continental Motors Corp.
50. Du Pont (E. I.) de Nemours & Co.
51. Republic Aviation Corp.
52. Signal Oil and Gas Co.
53. Magnavox Co.
54. Asiatic Petroleum Corp.
55. Western Union Telegraph Co.
56. Eastman Kodak Co.
57. Lear-Seigler, Inc.
58. Olin Mathieson Chemical Corp.
59. Curtiss-Wright Corp.
60. System Development Corp.
61. Johns Hopkins University
62. Bath Iron Works Corp.
63. Bethlehem Steel Corp.
64. Sverdrup & Parcel, Inc.
65. Morrison-Knudsen Co., Inc.
    Utah Construction & Mining Co.
    Perini Corp. and C. H. Leavell & Co.
66. Texas Instruments, Inc.
67. Gyrodyne Co. of America, Inc.
68. Continental Oil Co.
69. Control Data Corp.
70. Mitre Corp.
71. Vitro Corp. of America
72. International Harvester Co.
73. Union Carbide Corp.
74. Kaman Aircraft Corp.
75. Cutler-Hammer, Inc.
76. Standard Oil Co. (Indiana)
77. Norris-Thermador Corp.
78. Hayes International Corp.
79. Teledyne, Inc.
80. Stanford Research Institute
81. Burroughs Corp.
82. Gulf Oil Corp.
83. Cities Service Co.
84. Flying Tiger Line, Inc.
85. Richfield Oil Corp.
86. Firestone Tire & Rubber Co.
87. White Motor Corp.
88. Ryan Aeronautical Co.
89. Standard Kollsman Industries, Inc.
90. Atlantic Research Corp.
91. Motorola, Inc.
92. Condec Corp.
93. Chamberlain Corp.
94. Koppers Co., Inc.
95. Union Oil Co. of California.
96. Dynalectron Corp.
97. Rich (F.D.) Co., Inc.
98. Morrison-Knudsen Co., Inc.
99. Webb (Del E.) Corp.
100. Day & Zimmerman, Inc.

Army Announces Go-Ahead on New High Speed Helo

The U.S. Army has announced the go-ahead on development of 10 prototype high speed helicopters designed to fire a variety of weapons. They will be the first helicopters conceived and designed exclusively as weapons ships.

The Lockheed-California Company of Burbank, Calif., has been selected to develop the new vehicles.

Called the Advanced Aerial Fire Support System (AAFSS), the vehicle will be a radically new compound helicopter capable of cruising at speeds of more than 200 knots, 50 per cent faster than other operational Army helicopters. It will be twice as fast as armed helos now in action in South Vietnam.

The AAFSS was designed as an integral system, combining the aerial vehicle itself, avionics, weapons and ground support equipment. It will be powered by the new 3400 horsepower T-64-S4A gas turbine engine developed by the General Electric Company, Lynn, Mass., under a Navy contract.

Designed to replace the Army's present armed helicopters, which were adapted from troop carriers, the AAFSS will escort troop-carrying helicopters in air mobile operations and will provide suppressive fire in the landing zones.

A feature of the AAFSS is the use of Lockheed's advanced rigid rotor system which offers a highly maneuverable, as well as an extremely stable, platform at both high and low speeds and while hovering. The advanced helicopter will incorporate a thrusting pusher prop, short stubby wings and an anti-torque rotor in addition to the main rotor blades.

In battle, the AAFSS, with its two-man crew, will employ a variety of weapons including machine guns, grenade launchers, rockets and antitank missiles.

DSA Issues Sampling Guide

The Defense Supply Agency has published a handbook which provides basic information on sampling inspection principles, methods and procedures for personnel concerned with the utilization of an effective quality assurance technique.

The new guide, DOD Handbook H-53, "Guide for Sampling Inspection," June 30, 1965, supercedes Inspection Handbook H-105, "Administration of Sampling Procedures for Acceptance Inspection," April 27, 1954.

Copies may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Ave., Philadelphia, Pa. 19120.

DEPARTMENT OF DEFENSE

Dr. Finn J. Larsen has been selected for appointment as Principal Deputy Director of Defense Research & Engineering. He succeeds Dr. E. G. Fubini, who served as Asst. Secretary of Defense (Deputy Director of Defense Research & Engineering) until last July. The position has since been redesignated Principal Deputy Director of Defense Research & Engineering.

Mr. Jack Moskowitz, former counsel for the U.S. Senate Sub-committee on Anti-Trust and Monopoly, was sworn in Nov. 24 as Deputy Assistant Secretary for Civil Rights and Industrial Relations in the Office of the Assistant Secretary of Defense (Manpower). He succeeds **Stephen N. Shulman**, now General Counsel for the Air Force.

Brig. Gen. Robert H. Herman, USAF, Commander, Defense Construction Supply Center (DCSC), Columbus, Ohio, will retire from active duty effective Jan. 31, 1966.

Brig. Gen. Jefferson J. Irvin, USA, has been designated Deputy Assistant Secretary of Defense (Reserve Affairs), Office of the Asst. Secretary of Defense (Manpower), succeeding **Col. James F. Hollingsworth**, USA, who has volunteered for duty in Vietnam.

Mr. Walter N. Morse has been appointed Counsel for the Defense Communications Agency. He succeeds **John G. Gregg**. Morse's appointment became effective Oct. 25.

DEPARTMENT OF THE ARMY

Brig. Gen. Charles W. Eifler, Deputy Commanding General, Land Combat Systems, U.S. Army Missile Command, Redstone Arsenal, Ala., will be promoted to the rank of major general and reassigned to duty in Vietnam. Gen. Eifler's replacement has not been named yet.

Col. Robert E. Kimball has been appointed Director of Army Research and **Col. Edward B. Kitchens, Jr.**, has been named Chief, Air Mobility Div., Directorate of Developments, both in the Office of the Chief of Research and Development, U.S. Army.

Dr **John C. Hayes** has joined the staff of the U.S. Army Research Office, Arlington, Va., as Chief of the Programs and Concepts Branch, Scientific and Technical Information Div.

Appointment of **Col. Joyce B. James** as Director of Plans and Operations, Headquarters, Army Strategic Communications Command, Washington, D.C., has been announced.

Col. Kenneth B. Cooper is the new Director of the Army Engineer Reactors Group, Fort Belvoir, Va. He succeeds **Col. Robert B. Burlin**, selected for the National War College, Washington, D.C.

ABOUT PEOPLE

DEPARTMENT OF THE NAVY

RAdm. Alexander C. Husband has relieved **RAdm. Peter Corradi** as Chief of the Bureau of Yards and Docks and Chief of the Navy Civil Engineer Corps. Adm. Corradi, on being relieved, was retired from the service with 25 years active duty.

RAdm. Nathan Sonenshein has been assigned as Program Director, Fast Deployment Logistics Ship Project.

RAdm. Arthur R. Gralla has been assigned to the post of Deputy Chief of the Bureau of Weapons. He relieves **RAdm. Earl R. Eastwold**, who has been reassigned as Commander, Middle East Force.

RAdm. Edward J. Fahy has been designated Chief of the Bureau of Ships; **RAdm. John J. Fee** is the new Deputy Chief of the Bureau of Ships.

Marine Corps **Brig. Gen. Arthur H. Adams**, present Director of Information, Headquarters, U.S. Marine Corps, will be reassigned in March to the post of Commanding General, Marine Air Reserve Training Command, Glenview, Ill.

DEPARTMENT OF THE AIR FORCE

Maj. Gen. Richard L. Bohannon has been appointed as Surgeon General of the Air Force in the grade of lieutenant general.

Maj. Gen. John W. White, Commander, Air Force Special Weapons Center, Kirtland AFB, N.M., has announced plans to retire early in 1966. **Col. Ralph S. Garman**, formerly Commander, Air Force Missile Development Center, Holloman AFB, N.M., will take his place as Center commander.

Brig. Gen. William R. Yancey has been assigned as Vice Commander, Aeronautical Systems Div., Air Force Systems Command, Wright-Patterson AFB, Ohio.

Col. George W. Lutz has been assigned to the Directorate of Operations, Hq, USAF, as Chief of Test Operations AF Weapons Effectiveness Testing).

Lt. Col. Allan D. Read, Director of Information, USAF Tactical Air Warfare Center, Eglin AFB, Fla., has announced his decision to retire after 25 years service. Named to replace him is **Maj. Bartholomew F. McCarthy**.

Lt. Col. M. R. Richards has been named to head the AFSC Flight Dynamics Laboratory's new V/STOL Technology Division at Wright-Patterson AFB, Ohio.

Three Million Dollars in Residual Contract Property Distributed

Three million dollars worth of excess contract property no longer needed by Government contractors has been distributed by three Defense Contract Administration Services Regions (DCASR's) for reuse by the Department of Defense, Federal civil agencies and state institutions.

Reutilization and disposal of this residual property was achieved by DCASR headquarters in Philadelphia, Detroit and Dallas during a three-month period.

The excess property became available as a result of contracts being terminated prior to completion for such reasons as new designs and changing requirements, through reutilization possibilities of property which had served its purpose during performance of contract, and property left over at the end of a contract.

Property included raw materials, such as metals, plastics and lumber; equipment and machinery, such as fork lift trucks, warehouse moving and production machinery; and work-in-process, which might comprise anything from a partially made uniform to a sled for hauling military equipment in Alaska.

First priority for the materiel was given to the Department of Defense. Materiel left over after screening by DOD was offered to Federal civil agencies. The acquisition of materiel made available to state institutions was handled through the Department of Health, Education and Welfare and the General Services Administration. Institutions benefiting from the reutilization program included hospitals, colleges and welfare and research agencies.

The three DCASR's also sold a total of a quarter of a million dollars worth of usable property left over from the contracts to the public during the past fiscal quarter. This materiel was sold after no one claimed it for reutilization within the Government.

Contract property coming under the category of scrap and salvage brought an additional $168,000 through sale to the public. This resulted in a total of about $400,000 credited to contracts as a management effort in conserving appropriations.

(*Continued from Page 2*)

ventional warhead. The TOW will give U.S. infantry units for the first time an automatic antitank system wherein the gunner has only to keep his sight on the target and the missile will be automatically directed to the target. A significant key to the success of TOW will be in the greatly improved optical qualities of its sight, as well as the mechanical aspects of its mount. Due to these features, gunner training time as well as gunner selection time can be vastly reduced.

In this connection, one of our industry partners has recently developed an airborne sight for the TOW which will allow us to mount it on a helicopter. The airborne gunner can keep his cross-hair on his target while the helicopter undertakes maneuvering action.

In this same area we are developing a new main armament system for combat vehicles. It is called the Shillelagh, and incorporates guided missile capability with a very high probability of first shot hit and kill. Both the missile and the conventional round will be capable of being fired interchangeably from the same 152mm gun-launcher. Again, one of the key factors to the success of the system is its sighting unit. As with the TOW, Shillelagh has an automatic correction to target feature.

The Shillelagh system is proving to be most successful, and one which we expect to be capable of defeating any other known armored vehicle in the world.

As a follow-on to current guidance systems, we are working on systems which employ optics to sense reflected energy from the target area. What we would like to have is a system whereby natural contrasts are used as the key. Let's say we want to shoot at a tank. We are learning how to program into our missile's guidance brain an electronic-type map of what a tank will look like in relationship to its background. We tell it, "go find something that matches this signal!"

The missile speeds on its way toward the target—an onboard optical system scanning ahead. When it picks up the intended target a matching signal occurs and by electronic impulses the missile then guides itself to the mark. However, when the missile veers off course and a corrective signal causes a control action to bring it back on course, high internal inertial forces are set up. Therefore, light optics in the form of plastics are being considered. Such a guidance system as this has the big advantage over current wire-guided systems such as TOW of allowing the gunner to duck or to immediately engage a new target instead of remaining exposed and flying the missile all the way to the target.

Another new weapon which features an improved optical sight for fire control is the Redeye, a bazooka-like weapon being developed for use by one man for forward area air defense. The Redeye uses a missile with an infrared heat-seeking guidance unit in the nose. Good test results have been attained with Redeye against aerial targets at ranges in excess of two miles and at speeds in excess of 400 knots or about 450 MPH. Since this will be a weapon handled, aimed and fired by one man using only muscle power, a light but highly effective optical sight is crucial. The sight must allow the gunner to pick up his target rapidly, track it and eyeball in the estimated correct amount of lead.

These are all examples of the growing sophistication of modern fire control requirements.

Target Acquisition Requirements.

But all these advances and those which are being sought in weaponry will be of little value if we can't answer these four questions: Is a target there? (detection) What is it? (identification) Where is it? (location) How big is it? (description).

Part of the answer to this problem area rests with better night vision capability. One of the great changes in warfare which came about in the 20th century has been the growing use of night hours as a time for operations. One hundred years ago during the American Civil War major combat operations were confined to daylight hours; the periods of darkness were used for the most part as rest periods. But today there is an ever-increasing tendency, particularly among under-armed and insurgent forces, to fight at night. The principal reason is obvious; the increasing efficiency of modern weapons forces one to use darkness to neutralize or diminish the effectiveness of modern firepower. Of course, there is the additional motive which seems to be characteristic of 20th century life—there aren't enough hours in the normal day to do all we want to do. Modern war is no different.

As a result the Army has an urgent need to develop better night vision equipment. Ultimately, we would like to be able to operate in the field with near daylight efficiency—or in any event, with a considerable advantage over the enemy. To that end, the Army has been pushing the development of such devices, particularly passive types or image intensifiers. The great advantage of this approach over the infrared systems of World War II and the Korean War is that the image intensifier does not emit any electronic signal which is subject to detection, thereby rendering the user liable to positive countermeasures. These devices are capable of intensifying any available light many thousands of times.

However, there are many problems still to be overcome, not the least of which are weight, cost and durability. For example, the lens assembly alone for one type device weighs 14 pounds, a vast improvement over previous systems of similar performance with weight in excess of 60 pounds. In addition, the development cost for each of these assemblies was over $10,000 each, and in limited production quantities of approximately 100 units the cost is still more then $7,000 per lens. Ways must be found to lighten the weight and reduce cost.

Still other answers to the problem of finding and identifying targets rest with such sensory devices as acoustical, infrared imagery, ultraviolet, photography, radar, TV-type scanners and perhaps some facet of laser-optics. Currently, we are exploring means of improving the capabilities of all of these, since no one of them can do the job alone. Each has its strong points but each has its limitations as well. These limitations

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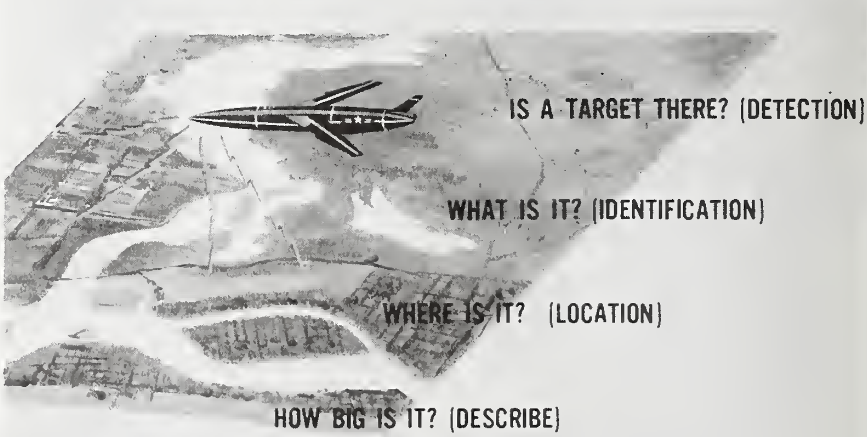
IS A TARGET THERE? (DETECTION)
WHAT IS IT? (IDENTIFICATION)
WHERE IS IT? (LOCATION)
HOW BIG IS IT? (DESCRIBE)

Equipment Readiness: an Achilles Heel

by

H. E. Witt, Deputy for Supply & Maintenance
Office of Asst. Secretary of the Air Force
(Installations & Logistics)

Changing patterns in Defense management is a theme that many individuals—in both industry and the Department of Defense—have had frequent opportunities to reflect upon in recent months. That management patterns are changing and will continue to change must be accepted, although many of us are reluctant to accept such changes. One area that is changing rapidly is defense readiness. This is significant because in our day-to-day operations we find that our efforts are channeled toward one basic objective—readiness.

Readiness is a part of everyone's life, but in the military logistics field it *is* our life. Readiness is not always understood, probably because it is such a broad subject and because there are so many vital factors involved in achieving a state of readiness. One highly acceptable definition of readiness is swift responsiveness to planned military needs and being able to respond with relative ease, the latter being a most important element.

There are several types of readiness that affect our military posture. Industrial readiness, operational readiness, materiel readiness and equipment readiness. While the military establishment and defense industry are vitally concerned with all categories, the area of equipment readiness is probably the most significant. Equipment readiness differs from the other types of readiness in that it is concerned with the condition of equipment, by type, on an inventory basis. This includes equipment in the hands of troops, so to speak, as well as the equipment in stock. Industrial readiness is concerned primarily with the production base, while materiel readiness is the availability of materiel required to equip and support our force levels for a specified time period in support of planned operations. Covering all of these, we have operational readiness, a composite overview, in a period in time, of the whole status or condition of combat forces. The measurement of this readiness is concerned with many elements, such as personnel, training, supply, maintenance and many others.

To set the stage, it is important to briefly recall the background of increased attention to equipment readiness. In the late 1930's, our standing military force was in the order of 200,000 to 300,000 men. The battleship was a most dreaded weapon. The top speed of our inventory of 1,000 aircraft was about 200 miles per hour. Great reliance was placed on our general philosophy of national security, which was that, if need be, we could mobilize people and industry within a year or two and meet any challenges.

Thirty years and several wars later, we find that this philosophy has undergone a major change, a change that has brought with it a new world of problems to be solved. The standing forces now number more than two and one-half million people, with an arsenal of weapons and equipment valued at more than $100 billion. The top speed of our inventory of 30,000 aircraft exceeds 2,000 miles per hour, while missiles, a new family of weapons, travel at speeds up to 18,000 miles per hour.

The safety historically afforded by the two oceans has now turned to a source of threat from submarine launched missiles. Mobilization time has been reduced from years or months to days and hours or, in extreme instances, perhaps only minutes.

The major factor influencing the change since World War II has been the development and application of new technology to evolve more powerful and more accurate and longer range equipment for delivery of our payloads. The collapse of time to mobilize is the basis for the vital need of being in a continued state of mobilization, and requires that we achieve the capability for rapid response to maximize our military advantage. This, coupled with the growing mechanization of forces and greater dependence on equipment to wage modern warfare, creates a situation wherein military mission success, and perhaps national survival, depend heavily on continued equipment readiness. As a result, attention to readiness has become increasingly prevalent in the Office of the Secretary of Defense and throughout the Military Departments.

One illustration of the concern connected with equipment readiness can be provided through Secretary McNamara's establishment of the position of Deputy Assistant Secretary of Defense (Equipment Maintenance and Readiness). This action, which was effected several years ago, was followed by the formation of the Defense Equipment Maintenance and Readiness Council. This council, chaired by the new Deputy Assistant Secretary, functions as an advisory body to the top officials of the Defense Department. Membership consists of senior military and civilian representatives of the Military Services, the JCS staff, the Defense Supply Agency and the Office of the Secretary of Defense. Maintenance and supply functions are both represented. The council has been an effective instrument for improving communications and exchanging ideas in dealing with Defense-wide equipment support, policy and procedural matters. On a number of occasions, industry has been invited to participate in the council studies. One major task undertaken by this group was the development of a uniform system of equipment readiness reporting. While the initial effort by the Services covered only aircraft, revisions to this system have occurred which now encompass other equipment besides aircraft. As this report is expanded in scope, an improvement in the quality of the information received has occurred.

It is hard to dispute the fact that instant readiness is the key to mission effectiveness—and maintenance is the key to equipment readiness. To go back to my definition of readiness —prompt response, speed in accomplishment of the task and the ease in which it is accomplished—only through good maintenance can we be responsible and accomplish the task with reasonable speed. Unfortunately, in many cases, this is not easy. For our future systems, the key is going to be in designing maintainability into equipment.

For years maintainability has been traded off for operational needs. Today the requirement to actually design ease of maintenance is coming to the forefront and tomorrow, with still more complexity built into our systems, further tradeoffs in favor of maintainability can be expected. The many instances where equipment must be torn down almost completely so that the maintenance man can perform a relatively small job are common knowledge. This cannot be afforded in the future.

Along with maintainability, there is a need for greater emphasis on quality and reliability. Recognizing the growing importance of this aspect of the materiel field, the Department of Defense has clearly stated that the parameters of this subject will be closely examined. This will be accomplished thru the media of an in-house conference of over 100 representatives from OSD, DSA and the Military Departments. The objectives of this conference are to analyze the principal quality and reliability problems that confront the DOD, to assess pertinent current efforts and propose plans which are aimed at solving these problems. In addition, long range programs will be recommended to improve quality and reliability assurance efforts. In retrospect, it is more appropriate to say that the key to tomorrow's equipment readiness is design, quality and reliability.

(Continued on Page 12)

NOTES FOR EDITORS

Briefed below are some events and projects within the Department of Defense which may be of interest to writers and editors. If further information on any of these topics is desired, please write to Chief, Magazine and Book Branch, Office of Assistant Secretary of Defense (Public Affairs), Washington, D.C. 20301

AIR-INFLATED STRUCTURE SLATED TO HOUSE TEST FACILITY

One of the largest air-inflated structures in the world will be used to house and provide weather protection for a unique test facility at the Army's Fort Belvoir, Va. The pneumatic bubble, 210 feet in diameter and 105 feet high, comparable to a 10-story building, will house a facility in which the electromatic environment generated by nuclear explosions will be simulated in order to determine effects on military equipment and systems.

The hemispherical, air-supported structure, fabricated from vinyl-coated nylon, will have an inner liner for thermal insulation. Integral blowers and heaters will maintain positive pressure inside the structure and comfortable temperatures during the winter months. It will also have an automatic pressure-regulating control system and emergency power generating equipment. Equipment will be taken in and out of the structure through a 24-foot long airlock having doors 10 feet wide and 12 feet high. For items larger than the airlock, the structure can be deflated and opened to permit entrance or exit.

The air-supported structure was chosen over a conventional building because it is relatively transparent to electromagnetic signals and will provide minimum reflection while providing weather protection for personnel and equipment.

BATTLE TO SAVE GREEN SEA TURTLE IN FIFTH YEAR

For the fifth consecutive year Navy turtle toters have transported newly hatched green sea turtles from the shores of Costa Rica to areas of the Caribbean where they are no longer abundant. Operation Green Turtle, a cooperative effort of the Navy, the Caribbean Conservation Corporation, the National Science Foundation and the University of Florida, is designed to replenish the Caribbean's supply of big turtles and to study their habits.

When female green turtles reach maturity, between the ages of five and seven years, they return to their place of birth and lay eggs. They return to the same location every three years thereafter, laying three to five litters of about 100 eggs each. The turtle experts hope that the transplanted babies have bad memories and will return to the areas where they were transplanted.

The green sea turtle is an excellent source of meat and for that reason was slaughtered indiscriminately by early settlers of America. Recent sightings of the amphibians near Caribbean land areas where none have been seen for more than 100 years indicate that the operation is making some progress. Near the mouth of Costa Rica's Tortuguero River, green sea turtles have been coming ashore to lay eggs in increasing numbers each year.

DARK, HEAT REFLECTING PAINT DEVELOPED FOR MISSILES

The development of a dark, heat reflecting paint by the Army's Aberdeen Proving Ground, Md., could produce color changes in the home building and automotive industries of America. The breakthrough in what was long considered "a nearly impossible" search is the result of a year's intensive research for a dark camouflage paint for Army missiles. The white paint now being used on Army missiles does reflect heat and helps protect the temperature-sensitive components inside, but it also makes them easy to detect from the ground and air.

Potential uses of the paint are not limited to missiles. Army instrument trailers and vans which require air conditioning would be easier to cool if coated with the new paint, tests indicate. Durability of the paint under heat and rapid temperature changes remains to be determined.

Aberdeen scientists said that it shows a good degree of infrared reflectance. They also said that the paint formula may be applicable to other colors as well as olive drab, the color used in the development.

Five U.S. Air Force officers have set nine world speed and altitude records with the YF–12A supersonic interceptor and won Distinguished Flying Crosses. The jet class speed records included a world record of 1,643.041 miles per hour for the 500-kilometer closed course, 2070.101 miles per hour for a straight course speed record and 80,257.86 feet for an absolute sustained altitude record.

Managerial Skills Honed at Defense Weapon Systems Management Center

by
Col. John F. Harris, USAF
Commandant, Defense Weapon Systems Management Center

The establishment of a training center for system project management was formalized by the Department of Defense in DOD Directive 5160.55 signed by Deputy Secretary of Defense Cyrus R. Vance on October 26, 1965. The order provides for a centralized activity to train selected military and civilian personnel of all DOD components in the effective management of programs concerned with the development, acquisition and integrated logistic support of weapon and support systems.

Responsibility for establishment and operation of the Defense Weapon Systems Management Center (DWS MC) is assigned to the Air Force, under the administrative and command authority of the Air University and the Air Force Institute of Technology. The center is located at Wright-Patterson Air Force Base, near Dayton, Ohio, and has been in operation since September 1964.

The primary mission of the center is to stress the identification and solution of typical system/project management problems, and maintain a close relationship between actual problems and the curriculum. This training is intended to enhance the student's ability to understand the project specialists with whom he will interface; to recognize special interests or biases of in-house or contractor personnel when analyzing problems; and to ascertain and assemble the facts necessary for making correct and timely decisions. In addition to its 11-week resident course, offered each quarter, the center serves as a focal point for interchange of concepts, ideas and techniques among the three Military Services, Office of the Secretary of Defense (OSD) and the defense-industry complex. DWSMC objectives support an approach to commonality of systems management terms and project practices that will contribute significantly to facilitating industry's application of its responsibilities in national defense. Providing continued research and identification of weapon systems management concepts, doctrine and techniques is a vital part of the program.

The Defense Weapon Systems Management Center traces its concept to the Department of Defense Conference on Program Management held in April 1963, at New London, Conn. After reviewing the final report of the conference, Mr. Roswell Gilpatric, then Deputy Secretary of Defense, stated: "One task which becomes evident is the accumulation of a cadre of officer and civilian personnel adequately trained to manage our major weapons programs. A central training establishment and a curriculum which covers the broad skills required should be planned and implemented at an early date. This conference convincingly demonstrated that the essential problems and skills are common to all weapons managers irrespective of Service."

Although operated by the Air Force, the center's prime objective remains to maximize its service to all of the Military Departments. Faculty members are commissioned officers of the Army, Navy and Air Force, and are selected for their academic background and their managerial skills acquired from recent experience in systems development and acquisition management.

DWSMC is provided OSD policy guidance by the Director of Defense Research and Engineering (DDR&E), and maintains liaison with the Defense Logistics Management Training Board. A Joint Advisory Group, composed of the Commanding General, Army Materiel Command; the Chief of Naval Material; and the Commander, Air Force Systems Command, will review DWSMC operations and effectiveness in terms of users' requirements. This group will also recommend and coordinate changes in policies and standards and will be responsible for assuring continuing support to the center in all matters of user interest. DWSMC, as part of its evaluation process, invites OSD and Joint Advisory Group observers to all of its resident classes.

The resident academic program of the center utilizes lectures, seminars, case studies and exercises. Subject matter is presented by resident faculty members and by visiting lecturers representing line and functional specialties involved in system/project management. An important faculty contribution to the center is made by the Ohio State University Research Foundation. Heads of major military commands and high level DOD speakers contribute their time and thoughts in presentations and lectures on appropriate occasions.

The DWSMC curriculum is divided into three basic time-oriented phases, preceded by a background or introductory period and followed by a simulation exercise which brings into play all of the curriculum material. In the preparation of the curriculum, the life-cycle approach in the arrangement of the subject material was employed. Chronologically relating the subject material and problems in the order in which a system/project manager would most likely encounter them gives more realism to the course of instruction.

The first three weeks of the course are devoted to background material and to providing the student a basic understanding of the tools and techniques required before starting consideration of the life-cycle of weapon system/project acquisition. Some of the topics are listed below:

Why Project Management?
The System Acquisition Process.
OSD Organization and Mission.
Project Management Philosophy—Army, Navy and Air Force.
The Defense Industry Complex.
The Budget Process.
The Hitch Program Package.
Cost Estimating and Cost Analysis.
Management Information Systems.
Management Uses of Computers.
Reporting.
Time and Cost Controls.
PERT/Cost.
DOD Cost Reduction Program.
Procurement of Technical Data.
Contractor Performance Evaluation.

The fourth week is used to treat activities which occur during Concept Formulation. Topics include:

Requirements—National Resources.
Requirements—JCS.
Requirements—Service and User.
Service Criteria for Project Establishment.
Organizing for Project Management.
Manpower and Staffing.
Technical Development Plans.
Prerequisites to Contract Definition.
Concept Formulation Case Studies.

The fifth and sixth weeks are used to discuss the events and problems which face the system/project manager during Contract Definition. Topics covered in this period include:

Contract Definition Activities.
Contracting in Contract Definition.
Functional System Analysis.
System Specifications.
Multiple Incentives.
PERT Exercise.
Integrated Logistic Support.
Support Planning.
Source Selection.

- Proposal and Price Evaluation.
- Negotiation.
- Contract Definition, A Case Study.
- DDR&E Management of Research, Development, Test & Evaluation.

The material presented up to this point pertains to those activities required prior to a final decision to proceed with Engineering Development or Operational Systems Development. This is commonly referred to as the Acquisition Phase and is covered in the next four weeks of the course. DWSMC Acquisition subjects include:

- Systems Engineering.
- Configuration Management.
- Reliability and Maintainability.
- Technical Problem Analysis.
- Test Program Management.
- System/Project Management in Industry, A Case Study.
- Financial Management in a Project Office.
- Human Engineering.
- Training Requirements.
- Military Construction.
- Production Planning.
- Initial Weapon System Support.
- Logistics Cases, Math Models.
- Technical Publications.
- Provisioning.
- The Defense Supply Agency.
- Field Contract Administration.
- Quality Assurance.
- Impact of Changes.
- Production Contracting.
- Value Engineering.
- Production, Case Studies.
- The Total Package Concept.
- Logistics Support.
- Logistics Exercise.

The final week of the course is used to present a computerized management game embodying all the principles discussed during the entire course. Students are divided into teams which act as system/project offices. The object of the simulation is to field a weapon system to meet a Specific Operational Requirement, optimizing cost, schedule and performance. Sufficient background information is furnished to enable the teams to apply lessons learned during the course. Using a series of decision points, the exercise emphasizes the continuity of the manager's analysis and decision role, and the impact of his decisions on the cost, performance and schedule of his project. The exercise terminates with team presentations outlining the team approach, problems encountered, lessons learned and any other points of interest.

DWSMC accepts students from all branches of the Military Services and other Government agencies, such as NASA, the National Security Agency, Defense Communications Agency, Defense Supply Agency and the Federal Aviation Agency. Also, the DOD directive permits attendance by personnel from the defense industries. The larger portion of the 60 student spaces is shared equally by the three Military Departments. Student rosters to date include individuals assigned or enroute to system/projects such as Saturn, Polaris, Gemini, Omega, Nike X, General Purpose Vehicles, Pershing, Minuteman, ABRES, Hercules, AIMS, Sheridan, Tartar and many others.

Criteria for nomination of students are the same for Government and industry. Students must be currently assigned or have a forecasted assignment at the senior level in management of a major system/project. Students should have a baccalaureate degree in scientific, administrative or industrial specialities. Student grade levels are lieutenant colonel, commander, GS-14, or above. A security clearance of Secret is required.

Nominations for industry participation are handled by the Council of Defense and Space Industry Associations (CODSIA), located at 1725 DeSales Street, NW, Washington, D.C., 20036. Member industries should forward their requests through the appropriate association to Mr. Franz H. Ohlson, Jr., Executive Secretary of CODSIA. Industry spaces are available for Class 66-B, which will convene April 11, 1966.

The center's program to provide the Defense Department with specially selected and equipped managers competent to handle the complex problems of systems acquisition is well on its way. The products of past and future classes of the center will do much to provide managerial skills comparable to the importance of the weapon systems they are fielding. This highly trained corps of management experts will not only contribute to the DOD role in national defense, but to the defense industry effort as well.

DEFENSE PRIME CONTRACT AWARDS TO SMALL BUSINESS

(Amounts in Thousands)

	July-Sept. 1965	July-Sept. 1964
Procurement from All Firms	7,495.4	6,507.4
Procurement from Small Business Firms	1,474.3	1,268.7
Per Cent Small Business	19.7	19.5

The Army's Accent on Seeing

(Continued from Page 8)

may be occasioned by size and weight, range and by weather factors such as rain, fog, mist and cloud cover and resolution.

Of the various sensory devices, optical components are a key part in the infrared and photographic approaches, and the use of optical radars is being explored. Tremendous advances have been made in recent years in developing new photographic optics.

The Army is also undertaking research on lasers, which may find application in optical radars, in communications links, in computers and in battlefield illumination. Special optical problems are involved because of the extreme brightness and power of the laser as an optical source which tend to degrade the glass in optical components used with this source.

In this connection, the Army is undertaking research in the fascinating field of fiber optics. Fiber optics are very high aperture light conduits that find useful application in transferring images from one point to another over otherwise difficult optical paths. For example, in surgical work as an inspection device. Another example is the use in transfering an image on a cathode ray tube to subsequent optical equipment without the size and length requirements of normal optical devices. Unfortunately, end fibers currently become optically joined, with the result that in high resolution devices streaks appear along the length of the fiber. We are hopeful we can eliminate this end fusing.

Despite all these problems, the Army feels confident that today and tomorrow will see industry ready and able to meet and solve our demands.

Equipment Readiness

(Continued from Page 9)

Maintenance then follows to maintain the quality and reliability of the system. All of these important factors are interrelated and complement one another, leading toward greater ease in achieving equipment readiness.

The Department of Defense believes in placing the emphasis on preventing ills rather than treating them. The end result will be quick responsiveness with ease. Equipment readiness is more important today because mission success and national survival depend on it; it's difficult to maintain readiness in today's complex systems without first designing serviceability into the equipment. Greater emphasis on quality and reliability is a must if we are to improve overall readiness effort. Preparedness is one integral part of the defense effort. Without conscientious action to expand reliability and to assure continued high standards of quality, equipment readiness could be our Achilles heel.

SPEAKERS CALENDAR

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FEBRUARY 1966

OFFICE OF THE SECRETARY OF DEFENSE

Maj. Gen. W. S. Steele, USAF, Dep. Commandant, Industrial College of the Armed Forces, at Armed Forces Management Assn. Jacksonville Chapter, Jacksonville Naval Air Station, Jacksonville, Fla., Feb. 17.

ARMY

Maj. Gen. John J. Tolson, Commanding General, Army Aviation Center, Fort Rucker, Ala.; **Brig. Gen. George P. Seneff, Jr.**, Director of Army Aviation, Office of Assistant Chief of Staff for Force Development; **Brig Gen. Howard F. Schiltz**, Commanding General, Army Aviation Material Command, St. Louis, Mo.; and **Brig. Gen. Thurston T. Paul**, Assistant Deputy Chief of Staff for Logistics (Materiel Readiness) at the National Aerospace Services Assn. Eighth Annual Army Aviation Contract Services Symposium, Statler Hilton Hotel, Washington, D.C., Jan. 17.

Lt. Gen Ben Harrell, Commanding General, Army Combat Developments Command, Fort Belvoir, Va., at AUSA Target Acquisition & Surveillance Symposium, Fort Huachuca, Ariz., Jan. 25; at Armed Forces Communications Electronics Assn. Meeting, Fort Monmouth, N.J., April 6.

Brig Gen. George B. Pickett, Jr., Chief of Staff, Army Combat Developments Command, Fort Belvoir, Va., at Eighth Joint Industry-Military-Government Packaging, Materials Handling and Transportation Symposium, Washington, D.C., March 2.

NAVY

VAdm. Fitzhugh Lee, Commandant, National War College, at U.S. Power Boat Squadrons, Miami Beach, Fla., Jan. 21.

Hon. Paul H. Nitze, Secretary of the Navy, at Joint Meeting of Industrial College of the Armed Forces and National War College, Norfolk, Va., Jan. 25.

RAdm. Eugene P. Wilkinson, Dir., Submarine Warfare Div., Office of Chief of Naval Operations, at 1966 Winter Convention of the Institute of Electrical & Electronics Engineers, Los Angeles, Calif., Feb. 2.

AIR FORCE

Hon. Harold Brown, Secretary of the Air Force, at Joint Meeting of Industrial College of the Armed Forces and National War College, Washington, D.C., Jan. 12; at Air Force Assn. Convention, Dallas, Tex., March 24-25.

Gen. J. P. McConnell, Chief of Staff, at National Security Industrial Assn. Meeting, Los Angeles, Calif., Jan. 13; at Joint Meeting of Industrial College of the Armed Forces and National War College, Washington, D.C., Jan. 31; at Air Force Assn. Convention, Dallas, Tex., March 24-25.

Miniature Radio Gear To Be Tested by AF

The Air Force is planning to test microminiaturized radio equipment for possible application in communications services.

The equipment, in some cases one-tenth the size of that now in use, is compact, lightweight and portable. Because of its size, it has a small current drain and can be battery powered for a number of hours without outside electrical source.

A short, 20-mile test shot will be made along a point-to-point, line-of-sight link between the Air Force Communications Service-operated sites of Dannenfels and Bann near Ramstein AFB in West Germany.

A longer, 36-mile test shot will also be made between Dannenfels and Lindsey AFB at Wiesbaden, Germany.

Both links will be required to support 120 voice circuits while operating in the 2,000 megacycle band. Channels will be tested to determine frequency response, distortion, idle channel noise, stability and other factors.

The Air Force Communications Service, headquartered at Scott AFB, Ill., and the Ground Electronics Engineering and Installation Agency, of the Air Force Logistics Command, will conduct the six-month tests.

Defense Contractors Will Exhibit at Advanced Planning Briefings

Industry know-how in cutting Defense costs will be illustrated in five cities at exhibits scheduled for March and April 1966 in conjunction with five regional unclassified Advanced Planning Briefings for Industry. The exhibits and briefings are being jointly sponsored by the Department of Defense and the National Security Industrial Association.

The five locales are: Boston, March 3–4; Atlanta, March 9–10; St. Louis, March 16–17; San Francisco, April 12–13; and Washington, D.C. April 27–28.

The 70 exhibitors are major Defense contractors who have pledged an organized, systematic, intensive effort to institute efficiencies that will give the Defense Department increased value for its dollar. Three hundred and fifty examples of these efficiencies will be displayed at each exhibit. The exhibitors are all participants in the Defense Contractor Cost Reduction Program, which was established by the Department of Defense and industry in response to President Lyndon B. Johnson's request of Dec. 2, 1963, for "an affirmative program of cost reduction in the performance of Defense contracts." Guidelines for the program were issued May 15, 1964. The guidelines apply to contractors having an annual volume of Defense sales in excess of $5,000,000 exclusive of firm, fixed-price contracts. Certain other contractors specifically designed by DOD also are included in the program.

A contractor performance in reducing cost under this program is evaluated by DOD. The evaluation is used by the Department when making source selections and when determining profit and fee rates on negotiating contracts where cost analyses are obtained.

The exhibits are intended to provide a cross-fertilization of cost reduction ideas among contractors, to promote cost consciousness and to stimulate additional contributions by personnel in Government and industry.

A representative cross-section of the more than 1,000 ideas to be displayed at all five exhibits will be selected by the Department of Defense for use in cost reduction training aids.

Companies participating in the exhibits held during the series of Advanced Planning Briefings for Industry conducted last spring received commendatory letters from President Johnson.

The Navy Resale System

by
RAdm. Charles A. Blick, SC, USN
Commanding Officer, U.S. Navy Ship's Store Office

The Navy Resale System is a worldwide, multi-million dollar merchandising business. The Navy Ship's Store Office, Brooklyn, N.Y., which directs it as a field office of the Bureau of Supplies and Accounts, is a dynamic, flexible and responsive organization, alert to apply progressive management, merchandizing and financial principles and to respond to the needs of the Navy ashore and afloat.

The system and the Navy Ship's Store Office (NSSO) are relative newcomers to the Navy, having been established in 1946 after a thorough study of all Navy resale activities by a special committee appointed by the Secretary of the Navy.

The Navy Resale System comprises four separate programs: Navy exchanges, commissary stores, ship's stores afloat and Military Sea Transportation Service (MSTS) exchanges. For FY 1965 it was a $684 million business. The 166 Navy exchanges had annual sales of $413.8 millions. The 89 commissaries produced sales of $217 million. Ship's stores afloat with some 675 shipboard stores had annual sales of over $50 million, excluding sales of $5.5 million in clothing and small stores which are sold at cost. Rounding out the system are the Military Sea Transportation exchanges with $3.2 million annual sales.

Two of these programs—Navy and MSTS exchanges—are operated with nonappropriated funds, i.e., funds which have been generated from exchange operations rather than having been appropriated by Congress. However, the Government does provide facilities to house these activities and absorbs the payroll expense of military personnel assigned to exchanges. Government bottoms are also provided for shipments overseas.

Commissary stores and ship's stores afloat are operated with appropriated funds. Commissary stores, unlike the other three programs, are not operated for profit. However, they are required to operate on a self-sustaining basis with respect to: repaying the Government for the procurement cost of all merchandise sold; cost of all commercial transportation in the United States; maintenance of operating equipment and supplies; cost of utilities furnished to stateside stores; and inventory shortages due to shrinkage, spoilage and pilferage. There is also an assessment of 1% of sales for a reserve to defray the cost of new replacement equipment, refurbishments and capital improvements to commissary stores. Ship's stores afloat profits are limited to 15% on cost and, for the past several years, have averaged 11%.

The overall purpose of the Navy Resale System is to provide authorized patrons—broadly speaking, service personnel and their dependents—with quality merchandise and services at reasonable prices. By offering attractive, convenient, well-managed facilities, the Navy Resale System contributes materially to the morale of the men and women in the naval service. It provides a central hub for station community life and access to those items which makes life pleasant for shipboard personnel. It promotes through its generated profits (except commissary stores) a Navy-wide recreation program. It makes service life more pleasant, more neighborly and greatly contributes to the overall welfare of naval personnel and their dependents.

The recreation program consists of athletic programs, hobby shops, libraries, bowling alleys, movies afloat and other recreational activities. The profits from these resale activities represent a saving for the American taxpayer since at one time taxes paid for the program of leisure time activities of military personnel. Without the profits from Navy resale operations it would be necessary to appropriate approximately $26 million a year in order to assure continuance of Navy Recreation Programs.

Navy Exchanges.

Navy exchanges have no exact commercial counterparts because they cover a broader range of activities than the typical variety or department store. Exchanges not only sell candy, cigarettes, toiletries, clothing and other accessories, they are also engaged in a wide variety of service-type operations. These include cafeterias and snack bars, gas stations, barber shops and beauty parlors, laundries and dry cleaning plants, enlisted men's clubs and many other operations of a service nature.

The commodities which the Navy exchanges in the continental United States may sell are prescribed by the Armed Services Exchange Regulations. These regulations were originally issued in 1949 as a result of Congressional hearings on the subject of exchange sales and are applicable to all the Military Services. In addition to establishing the categories of merchandise authorized for sale, numerous cost price limitations were also prescribed. In general, the authorized list consists of the basic essentials of toiletries, candy, tobacco, stationery, underwear, plus reasonably low-priced semi-luxury items. The needs of personnel at overseas stations are such as to necessitate an expanded range of commodities, and authorized stock at overseas exchanges includes major appliances, additional items of clothing and a limited range of foreign manufactured goods. In addition, there are facilities for personnel to specially order a wide range of many other products available from United States sources, and not generally carried in stock by exchanges.

Experience has indicated that Resale System customers

Navy commissary store at the U.S. Naval Training Center, Great Lakes, Ill.

prefer merchandise which is nationally advertised and nationally distributed. However, exchanges may purchase and sell any authorized item from any source if the activity considers that the product represents good, competitive value, and that there would be sufficient patron demand to warrant investment in inventory.

To provide exchanges with the most popular brands of merchandise in the best selection, and in adequate price range, negotiations are conducted with manufacturers for the supply of their products. In accordance with retailing practices, negotiations include regular discount terms, packaging, etc. Suppliers are required to stipulate that the prices quoted are as low as any offered other purchasers. Merchandise, other than uniforms and accessories, is not required to be manufactured to specification; it is the regular lines and brands sold to commercial retailers.

Buyers and specialists at the Navy Ship's Stores Office continuously research markets and compare values seeking the best for customers. Their selections are further reviewed by a Merchandise Council composed of senior personnel in the office. In addition to visiting the markets, these buyers and specialists are available on Monday, Wednesday and Friday mornings to interview sales representatives and review their lines. Advance appointments are desirable and samples of products are required. In addition, the representative should be able to supply the following information:

- Special features of items; advantages over similar items available.
- Competitive price range.
- Sales response in exchanges.
- Minimum order and delivery time.
- Price information and terms.
- Standard packing and shipping specifications.

Following acceptance by the Merchandise Council, Price Agreement Bulletins and Merchandise Voces are issued to exchanges for use and guidance in selecting and procuring merchandise. Basic staple year-round merchandise is listed on Price Agreement Bulletins. Seasonal merchandise, such as clothing, shoes, etc., is listed on Merchandise Voces. However, the absence of a listing does not preclude any exchange from buying and stocking acceptable values of quality merchandise. In the case of overseas exchanges, all seasonal style merchandise for men, women and children is purchased by NSSO buyers based on inventory and sales information provided by each exchange.

Exchange officers and their procurement personnel have been instructed to extend courteous, considerate and impartial treatment to vendors and their representatives; however, appointments should be made in advance. Naturally, the answer to every salesman cannot be "yes." Among the reasons for possible rejection are: budget for department presently obligated; no evidence of customer demand (exchanges have a Want Slip system); price and quality not deemed equivalent to competitive products; item not authorized for resale; delivery period is excessive; and marketability has not been established, either commercially or in other exchanges.

MSTS Exchanges.

Each year, large numbers of military personnel are required to cross the oceans as a result of changes in duty assignments. This relocation not only concerns the individual directly in the Service, but often includes his dependents. The Military Sea Transportation Service is the single service manager for sea transportation and is responsible for transporting passengers and cargo for all agencies of the Department of Defense.

Sixty-odd MSTS vessels operate location exchanges aboard ship. Located at ports from which these vessels operate are the four "mother" shore-based exchanges—COMSTS Atlantic Area, COMSTS Gulf-Sub Area, COMSTS Pacific Area and COMSTS Far East Area. The shore-based exchanges located in Brooklyn, New Orleans, San Francisco and Yokohama, Japan, function as warehouses. These exchanges procure, receive, mark, store and issue the stock items required by location exchanges but do not engage in any resale activity.

Included within the authorized retail merchandise are items such as tobacco products, candy, toileteries, children's and infants' apparel and basic items of women's wear. Service activities may include barber shops, soda fountains and vending machines. The quantity and variety of stock taken aboard and services rendered are dependent upon the duration of the voyage and the number of people to be transported, giving due consideration to the composition of the embarked passengers and crew.

The general merchandising policies and principles that apply to Navy exchanges are also used by MSTS exchanges. They use the Price Agreement Bulletins and Merchandise Voces for sources and for guidance. Like Navy exchanges, they procure from other sources on the same

(Continued on Page 24)

Ship's store aboard the attack aircraft carrier USS Shangri La (CVA-38).

U.S. Marine Corps post exchange.

New Civil Works Authorizations Listed by U.S. Army Corps of Engineers

President Johnson has signed a new bill authorizing the participation of the U.S. Army Corps of Engineers in 150 civil works projects during 1965 which will cost an estimated $1,985,785,000.

Called the Omnibus Rivers, Harbors and Flood Control Act, the bill calls for 91 flood control projects, 50 navigation projects and nine beach erosion projects. The act also authorizes 33 surveys for flood control and 18 surveys in the interest of navigation and beach erosion control.

Following is a list, by state, of authorized projects which will receive Federal contribution of funds. Initials before the projects indicate N (navigation), FC (flood control), BE (beach erosion control), MP (multiple purpose) and HFC (hurricane flood control):

(CODE: 1. Location. 2. Description of project. 3. Dollar amount of Federal cost.)

ALABAMA

Bayou La Batre. (N) Channel deepening & widening. $262,000.

Perdido Pass. (N) Channel deepening & widening. $625,000.

ARIZONA

Indian Bend Wash. (FC) Levees & channel improvements. $7,250,000.

Phoenix. (FC) Dams, diversion channels & channel improvements. $58,310,000.

Santa Rosa Wash. (MP) Tat Momolikot Reservoir. $6,430,000.

Winslow. (FC) Levees & channel improvements. $2,775,000.

ARKANSAS

Lee Creek. (MP) Pine Mountain Reservoir. $10,000,000.

Little Rock Levees. (FC) Pumping plants. $363,000.

St. Francis Drainage Levee, Dist. 7. (FC) Channel improvements & gated water control structure. $1,372,000.

CALIFORNIA

Bodega Bay. (N) Breakwater; small boat harbor. $853,000.

Crescent City. (N) Deepen harbor basin; extend breakwater. $1,980,000.

Port San Luis. (N) Breakwaters; small boat harbor. $6,360,000.

San Francisco Bay to Stockton. (N) Channel deepening & widening. $46,853,000.

Eel River. (FC) Channel improvements; waterway easement; recreational facilities. $13,732,000.

Lytle & Warm Creeks. (FC) Channel improvements & levees. $9,750,000.

Napa River. (FC) Channel & recreational improvements. $14,950,000.

San Diego River. (FC) Channel improvements. $14,600,000.

Scotts Creek. (MP) Lakeport Reservoir & channel improvements. $9,360,000.

Sonoma Creek. (FC) Channel improvements & levees. $9,400,000.

Tahquitz Creek. (FC) Debris basin & channel improvements. $3,442,000.

Yuba River, Bullards Bar. (FC) Federal contribution for flood control. $8,979,000.

COLORADO

Arkansas River at Las Animas. (FC) Channel improvements. $1,541,000.

Trinidad Dam. (FC) Deletion of local cash contribution. $372,000.

CONNECTICUT

Housatonic River. (FC) Channel improvements, levees, floodwall & pumping plant. $5,100,000.

Stratford. (HFC) Levees, walls & pumping plant. $4,340,000.

FLORIDA

Duval County. (BE) Shore protection. $2,266,000.

Broward County. (N & BE) Jetties, channel improvement & beach nourishment. $1,093,000.

East Pass Channel. (N) Jetties & channel improvements. $1,151,000.

Fort Pierce. (BE) Beach restoration & nourishment. $220,000.

Jacksonville Harbor. (N) Channel deepening & widening. $8,484,000.

Ponce de Leon Inlet. (N) Channel improvements & jetties. $1,104,000.

Biscayne Bay. (HFC) Hurricane tidal barrier. $1,954,000.

Hendry County central & southern Florida project. (FC) Flood control & drainage improvements. $4,986,000.

Phillippi Creek. (FC) Channel improvements. $4,592,000.

Southwest Dade County central & southern Florida project. (FC) Flood control & drainage improvements. $4,903,000.

GEORGIA

Savannah Harbor. (N) Channel improvements, tide gates, deposition chamber. $13,669,000.

Flint River. (MP) Lazer Creek Reservoir. $40,378,000.

Flint River. (MP) Lower Auchumpkee Reservoir. $48,275,000.

HAWAII

Coasts of Hawaiian Islands. (N) Eightharbors for light-draft vessels. $4,737,000.

Haleiwa Beach. (BE) Groins, sand placement & breakwater. $572,000.

Honokahau Harbor. (N) Small boat harbor. $680,000.

Honolulu Harbor—Barbers Point Harbor. (N) Channel improvements, deep draft harbor & small boat harbor projects. $9,928,000.

Kawaihae Harbor. (N) Deep draft harbor; light draft harbor. $2,291,000.

Waikiki Beach. (BE) Groins & Beach restoration. $2,490,000.

ILLINOIS

Evanston. (BE) Beach fill & bulkheads. $392,000.

East St. Louis. (FC) Flood control & Interior drainage improvements. $6,180,000.

Kaskaskia River levees. (FC) deletion of cash contribution. $3,498,000.

Wood River Drainage & Levee Dist. (FC) Pumping station. $179,000.

INDIANA

Burns Waterway. (N) Deep draft harbor. $25,000,000.

Indiana Harbor. (N) Channel deepening & widening. $96,000.

Wabash River Interim Report 1. (MP) Lafayette & Big Pine Reservoirs. $44,800,000.

Wabash River Interim Report 2. (MP) Lincoln, Clifty Creek & Patoka Reservoirs. $72,900,000.

IOWA

Iowa & Cedar Rivers. (FC) Levees, floodwalls, channel improvements & appurtenant works. $17,570,000.

Big Sioux River. (FC) Channel improvements. $6,400,000.

Des Moines. (FC) Change in local cooperation requirements. $603,000.

Skunk River. (MP) Ames Reservoir. $12,893,000.

KANSAS

Big Creek at Hays. (FC) Channel improvements, levees, detention reservoir. $2,702,000.

John Redmond Dam. (FC) Acquisition of lands for national waterfowl refuge. $730,000.

Walnut River. (MP) El Dorado, Tonawanda and Douglas Reservoirs; and local protection. $66,036,000.

Arkansas River at Great Bend. (FC) Levees, channel diversion and channel improvement. $4,030,000.

KENTUCKY

Big Sandy River. (MP) Yatesville, Paintsville and Panther Creek Reservoirs; and local protection, $51,491,000.

Martins Fork Reservoir. (MP) $4,860,000.

LOUISIANA

Mermentau River. (N) Improvement of shallow draft channel. $2,690,000.

Bayou Bodcau. (FC) Levee & channel improvements. $1,524,000.

Caddo Dam. (FC) Replacement of dam. $1,934,000.

Grand Isle & vicinity. (HFC) Levee improvements. $5,500,000.

Lake Pontchartrain. (HFC) Hurricane barrier, locks & levees. $56,235,000.

Morgan City & vicinity. (HFC) Levee & drainage structures. $3,049,000.

Ouachita River at Monroe. (FC) Floodwall improvements. $520,000.

MAINE

St. John River. (MP) Dickey-Lincoln School Reservoir project for hydroelectric power. $227,000,000.

MARYLAND

Tred Avon River, Talbot County. (N) Channel deepening & widening. $323,000.

MASSACHUSETTS

Weymouth-Fore & Town Rivers, Boston Harbor. (N) Channel deepening & widening. $12,500,000.

MICHIGAN

Alpena Harbor. (N) Channel deepening & widening. $806,000.

Cedar River Harbor. (N) Channel improvements & rubble mound pier. $664,000.

Frankfort Harbor. (N) Channel deepening; maneuvering area & small boat anchorage. $237,000.

Lexington Harbor. (N) Small boat harbor. $570,000.

Saginaw Harbor. (N) Channel deepening. $437,000.

Grand River at Grandville. (FC) Levees & appurtenant works. $1,373,000.

MINNESOTA

Big Stone Lake. (FC) Dam on Minnesota River & channel improvements. $3,885,000.

Roseau River. (FC) Channel improvements; levees & culvert works. $2,550,000.

Zumbro River. (FC) Channel improvements. $975,000.

MISSISSIPPI

Mississippi River & tributaries. (FC) Expansion of Mississippi River & tributaries project. $181,109,000.

MISSOURI

Chariton & Little Chariton Rivers. (MP) Long Branch Reservoir, channel improvements. $9,167,000.

Fishing River. (MP) East Fork & Dry Fork Reservoirs. $7,260,000.

Grand River. (MP) Pattonsburg, Trenton, Mercer, Brookfield & Braymer Reservoirs; and local protection. $218,009,000.

Platte River. (MP) Smithfield Dam; channel improvements. $26,889,000.

MONTANA

Sun River at Great Falls. (FC) Deletion of local cash contributions. $31,000.

NEBRASKA

Little Nemaha River. (FC) Levees & channel work. $1,524,000.

NEW JERSEY

Perth Amboy. (BE) Bulkhead for shore protection. $82,000.

Shrewsbury River. (N) Channel improvements & jetties. $4,090,000.

Rahway River. (FC) Local protection at S. Orange. $1,514,000.

Elizabeth River. (HFC) Levee & channel improvement. $9,769,000.

NEW YORK

New York, New Jersey Channels. (N) Deep draft channel widening. $2,581,000.

New York Harbor anchorages. (N) Enlarging & deepening anchorage areas. $44,852,000.

Rondout Harbor. (N) Channel improvement. $20,000.

East Rockaway Inlet & Jamaica Bay. (HFC) Hurricane barrier, beach fill & periodic nourishment. $32,620,000.

Staten Island. (HFC) Beach fill, levees, groins & drainage facilities. $6,230,000.

Saw Mill River & tributaries. (FC) Channel improvements, levees & floodwalls. $1,924,000.

NORTH CAROLINA

Cape Fear River. (N) Shallow draft channel improvements. $1,510,000.

(*Continued on Page 23*)

FROM THE SPEAKERS ROSTRUM

VAdm. I. J. Galantin, USN

Excerpts from address by VAdm. I J. Galantin, USN, Chief of Naval Material, at the Electronics Industries Assn. Systems Effectiveness Conference, Washington D.C., Oct. 19, 1965.

Systems Effectiveness

* * * * * * * *

One of my primary functions as Chief of Naval Material is to allocate resources—men and talent, money and facilities. I have to synthesize and arbitrate conflicting demands for finite resources. Almost every request for resources that I receive is phrased in terms such as: "I need more people and more money. If you will give them to me, I can deploy my system in less time and at reduced overall cost."

More than three hundred systems compete for Navy resources, and industry has at least as many more proposed systems waiting in the wings. Navy systems must, in turn, compete with the Army and Air Force systems within the resources available to the DOD.

The diversity of Navy systems is difficult to appreciate. They span the entire spectrum of warfare. In the naval sphere systems proposals extend from equipment for underwater swimmers to space vehicles, from plastique limpet mines to thermonuclear devices. Defense decision makers are called upon to appraise these diverse systems, relate them to defense needs and appropriately apportion resources to their support.

But diversity among systems is not the only decision problem area. For any given mission objective a number of competing possible approaches must be appraised. Each of these proposed systems may have a champion who is doing his persuasive best to "sell" his approach. Each champion has his own compelling argument. Each system excels in some particular:

"A" is more reliable.

"B" will be less expensive.

"C" uses fewer people.

Fortunately we have a way of working out the best overall solution. The systems effectiveness discipline provides a framework for molding many alternatives into one optimum system.

Other frameworks are useful for their purposes. Contract definition and formal source selection procedures are excellent tools. PERT, milestoning and similar management techniques are superior cost and scheduling mechanisms. But in themselves they do not substitute for a discpline oriented toward mission accomplishment.

The methodology of systems effectiveness provides an excellent means of solving one important problem—the problem of expressing "judgment". Managers are required to make judgment decisions. And too often in the past, judgment was equated with persuasive argument and the turning of phrases. Now it's not.

The systems effectiveness discipline gives visibility to judgments. It analyzes and explicates judgments. . . .

Systems effectiveness provides a structure in which figures, proved or estimated, measured or guessed at, can be prominently displayed, arrayed against competing figures and analyzed under a spotlight. It gives formal visibility to the decision process as a whole.

Here are some of the considerations which might go into a typical systems effectiveness analysis. . . .

Within the management field, for example, systems effectiveness becomes the goal of the comptroller, the project manager and the management analyst.

On the military side, the systems effectiveness discipline combines the point of view of the strategist, the operations analyst, the tactician and the fleet sailors.

Systems effectiveness is even more compelling in drawing together the engineering fraternity. The past 15 or 20 years have been marked by the development of a number of important engineering disciplines. Two classic examples are reliability engineering and maintainability engineering. Others are value engineering, safety engineering and human engineering. The logistician is now thoroughly appreciated, whereas 15 years ago he was relegated to some shadowy organizational box called "supply support." Overall, a sizeable number of separate varieties of engineers, managers and military types contribute today to systems effectiveness. . . .

Now let's see who in the Navy is most concerned about systems effectiveness.

Of course it is a truism that concern for systems effectiveness reaches throughout the military hierarchy, through the Office of the Secretary of Defense and upward through the highest levels of the executive and legislative branches of our Government.

But the specifics of this concern tend to focus on one individual, the Chief of Naval Material. As Chief of Naval Material I am responsible (with certain exceptions) for providing the material support of the operating forces of the Navy and the Marine Corps. Fortunately, I have lots of good help, the four material bureaus and the Navy project managers. . . .

The bureaus and the projects are under considerable pressure to "do good work" at top speed and at minimum cost. The pressures which are perhaps most obvious and best publicized are those which call for reducing costs. But optimum costs are always related to optimum engineering. There is no such thing as cost effectiveness without systems effectiveness.

So these key line elements of the Naval Material Support Establishment—the people with whom many of you work on Navy warfare systems—shape their decisions in terms of systems effectiveness. They have to. The standards established for Navy Technical Development Plans require the developmental groups to build their systems effectiveness decisions around the various systems effectiveness formulas. Thus this concern is real, formal and enforced. It is not academic or remote.

So far I have discussed systems effectiveness largely in terms of the military employment of the concept, and as expressed by the Navy's analysis of the systems effectiveness problem. The systems effectiveness philosophy, however, is not limited to the military manager, nor is the Navy approach the only approach.

The Air Force Systems Command (AFSC), through the Weapons Systems Effectiveness Industrial Advisory Committee (WSEIAC), has developed a separate systems effectiveness methodology. The WSEIAC procedures differ somewhat, but not fundamentally, from those of the Navy.

The conceptual models developed by AFSC and by the Navy provide management tools not only for the military but for industry as well. Using these tools, top management in industry is in a better position to appraise its own effort and, through use of common and compatible tools, can better understand the military decision process.

Industry can contribute to the further development of the systems effectiveness concept. This participation, I believe, will be in two separate areas. The first will be the further detailed development of systems effectiveness methodology, techniques and model structures. The second will be the engineering application of this discipline to systems of the future.

The Navy cannot afford to "build one and try it" or to subsequently patch on reliability, maintainability, value engineering and the like in some "get well" program. Both the military and industry must further refine the techniques with which to do their systems engineering homework.

It should be understood by both the military and industry that systems effectiveness imposes a hard discipline. Decisions have to be faced squarely and early. Concepts have to be explicated. Judgments become visible—and challengeable. Planning and analysis in depth are mandatory.

The pay-off, both for the military and for industry, however, is high. Through the systems effectiveness discipline, management can obtain not only better decisions but a higher and earlier confidence in these decisions.

Gen. B. A. Schriever, USAF

Excepts from address by General B. A. Schriever, Commander, Air Force Systems Command, at Air Force/Industry Data Management Symposium, Los Angeles, Calif., Sept. 28, 1965.

The Data Management Challenge

If the format of this Data Management Symposium should remind some of you of the management conference held at Monterey in May of 1962, that would be perfectly natural. That conference was both the inspiration and model for this one. It was at Monterey that Air Force data management received its strong new impetus and direction. . . .

The Monterey conference directed attention toward our growing data problems. In the three years since Monterey, we have made considerable progress toward solving a number of them.

First, we have brought data requirements in contracts out in the open. In this way we have given visibility to a major cost area of systems acquisition which had previously been hidden. We can now question the necessity of various data requirements, determine whether they best serve their intended purpose and assure that they meet the specific needs of our modern system management techniques. . . .

Second, we have cut down significantly on Air Force data storage and retrieval requirements through the concept of deferred ordering of data. Under this method, provision is made for the contractor to retain certain data until specifically ordered for Air Force use. This approach places a constraint on our people to order data only when actually needed, and it assures that the data received will be completely up to date. . . .

Third, we have developed a cadre of Data Management officers and supporting personnel who have a comprehensive view of the field and are able to work with their counterparts in industry to iron out data problems contract by contract and item by item.

Fourth, the Systems Command and the Logistics Command have achieved excellent cooperation in managing data over the entire life cycle of systems. This cooperation is essential since data cannot be isolated in organizational compartments. Rather, the basic data flow must be continuous from a system's conceptual phase through its final disposal.

Fifth, we are working with Headquarters, U.S. Air Force, participating in joint committees and other efforts to standardize data management policies and procedures throughout the Services, the Defense Supply Agency and NASA. Since we all work with the same industrial community, it makes sense to standardize where we can. The Air Force Authorized Data List, as set forth in Volume II of AFSC/AFLC Manual 310-1, lends itself to standardization by the Department of Defense for routine administrative type items. It also provides a cross check of departmental requirements. . . .

I am pleased with the progress we have made in data management, but I am far from complacent. We have won a number of battles against excessive data requirements, but we have not yet won the war.

To keep a strict discipline on Air Force data requirements we should know what data a contractor will generate in support of his job. Most of this information is identical to that needed by Air Force people to do their jobs. It may have to be documented differently to be useful to us, but the basic information is the same. In view of this fact, I expect our data managers to bring about the greatest possible Air Force use of the data which is the normal fallout of the contractors' efforts. At the same time they should strive for the least amount of change in format in contractor data submitted to the Air Force. This means that we must expand our efforts to tailor Air Force data-acquisition programs to the contractor's data-generating activities. When we achieve this, we will get the information we need at the lowest cost and with the least interference in hardware development.

Now I would like to throw out another challenge—the need to foster innovation in our research and development management. Our data management efforts to date have been concentrated on the acquisition of information pertinent to the mainstream of systems program development during and after the definition phase. Yet R&D fields, apart from this mainstream, also generate vast amounts of data. These have not always been given an adequate degree or level of management attention, with the result that the flow of R&D information to our systems and equipment programs may sometimes be deficient.

We need better overall internal control of the flow of R&D documentation. If we can achieve this, we will be tackling data acquisition problems throughout the entire life cycle of our systems. . . .

The importance of solving our data problems should be clear to all of us. This age of rapid change makes unprecedented demands on our management skills. Fewer major systems are coming into the inventory, and these are increasingly complex. As a result, rapid, accurate and streamlined communication between Government and industry was never more important than it is today. The restraints of dollars, performance and schedules demand that we exert efficient controls on all aspects of our programs.

Thus the need for efficient data management permeates the fabric of all our management activities. It is increasingly important to improve our mutual understanding of each other's jobs, the decisions we have to make and the data we need to support these decisions.

Procurement Career Program Initiated for Military and Civilian Personnel

A milestone in procurement management has been established by the Department of Defense with the initiation of a career development program for more than 25,000 civilian and 3,300 military procurement personnel. This program, a DOD-wide career plan, could easily serve as the model for similar career growth plans in all logistics functional areas.

The common objective of both the Military Procurement Career Management Program and the Civilian Procurement Career Management Program is to combine the best futures available from career programs existing in the Military Departments to improve the career system throughout DOD and to insure that we always have highly competent personnel in our key procurement management positions, as well as to provide ample opportunity for promotion throughout the entire system. Appropriate recognition of the inherent differences between military and civilian career progression objectives is acknowledged by the establishment of coordinated, DOD-wide systems for each.

It seems natural and logical that the first DOD-wide logistics career development program should start in the procurement career field. Since DOD obligates approximately $28 billion each year in procuring the equipment and services needed to support our Armed Forces, Secretary McNamara feels that it is essential that recognition be given to the men and women responsible for this important function, and that they have adequate opportunities for improved career specialization and promotion. On the broader front, it is clear that this philosophy meshes well with the President's expressed desire and practice of rewarding professional Government career people of outstanding competence with positions of greater responsibility. To date over 50 Federal executives have been promoted by the President to top positions in their agencies.

In addition to the sheer size of the procurement task, another reason for selecting the procurement category as the pilot test area is the sensitive interface between Government buyers and the defense industrial community. In no other area is the need more critical for highly competent and qualified personnel or, when lacking, more apparent than in the negotiation and administration of contracts. In the past three and one-half years, DOD has concentrated management effort on (1) placing greater risk on contractors through contractual arrangements (contract types) which reward or penalize the contractor in relation to his performance on predetermined objectives and (2) on introducing many interrelated management disciplines (e.g., Project Management, Contract Definition Phase, Multi-Dimensional Incentive Contract, Multi-Year Procurement, Weighted Guidelines, Contractor Performance Evaluation, PERT/Cost, etc.). Hence, procurement has become much more sophisticated in the past three years and effective procurement now requires the wider application of broader skills and better techniques. Therefore, the assurance that qualified personnel are available—and sufficiently motivated—to man the key procurement jobs is essential.

The procurement career development program started with a request by Secretary McNamara, in January 1965, to the Assistant Secretaries of Defense for Manpower and for Installations and Logistics and to military and civilion designees from the Military Departments and the Defense Supply Agency to conduct a study and recommend the actions necessary to assure, on a continuing basis, that qualified men and women were available to carry out the procurement functions in the Defense Department. In approving the recommendations submitted by the Civilian Joint Study Group and by the Military Joint Study Group, Secretary McNamara stated, "When implemented, they [the recommendations] will represent an important step toward achieving improved career progression in the procurement function."

Civilian Procurement Career Management Program.

Widening the civilian career development field will be accomplished by the movement of employees across series lines of jobs, where necessary. Increased mobility of civilian personnel is an important objective of this program. Civil Service approval will be obtained. Occupational areas under the program include: GS-1101, General Business and Industry; GS-1102, Contract and Procurement; GS-1103, Industrial Property; and GS-1150, Industrial Specialist.

In addition, civilian positions in any other series are included where 50 per cent or more of the duties and responsibilities involve either pre-award or post-award contracting functions.

Training of employees will play an important role in the new procurement program. College graduates will be recruited to provide an adequate number of highly qualified personnel at a trainee level. These young grads may include industrial engineers, business administrators, managers, lawyers and liberal arts graduates.

Also, the program calls for mandatory training at the entrance, intermediate and senior levels of the employee's career field.

Secretary McNamara has further directed that the Services should investigate and develop a plan to provide for rotational assignments in industry. This will provide for better understanding of the special problems of both industry and Government.

The new program provides for the rotation of cross-training among DOD components in establishing the Civilian Procurement Career Management Program. The program is to be established within 12 months by the Assistant Secretary of Defense (Manpower) in coordination with the Assistant Secretary of Defense (Installations and Logistics).

Military Procurement Career Management Program.

Each Military Department is to provide for approval by the Assistant Secretaries for Manpower and for Installations and Logistics a time-phased plan for the accomplishment of the recommendations of the Military Joint Study Group. The Military Procurement Career Management Program requires each Military Department to establish a uniform system for insuring that qualified personnel are assigned to designated key procurement billets. They must also have minimum standards for qualification, including three years direct procurement experience, three years in procurement related functions and attendance at an executive training refresher course. Also, each Military Department will establish a broader base of procurement billets for 1st Lieutenant and Captain (Navy: Lieutenant (junior grade) and Lieutenant) and rotational patterns to utilize to the maximum extent practical those officers with procurement experience. This is the prime objective of the military program.

Other recommendations for the military program include maximum use of personnel with college and graduate education in the procurement field; minimum experience and educational requirements for each level; minimum tours for all procurement positions; and the maintenance of complete and current data on procurement personnel resources and requirements—including coordination with the Defense agencies to assure that requirements of those agencies will be met.

The Military Departments have identified those key procurement positions which should be filled by only military personnel and those positions

(Continued on Page 25)

BIBLIOGRAPHY

Defense Procurement Circular #36, Oct. 21, 1965. (1) Change of Effective Date of Revision 12. (2) Change of Mandatory Effective Date of Section 20, Part 2. (3) Use of DD Form 633 (Contract Pricing Proposal). (4) Revised List of Educational or Non-profit Institutions with Approved Patent Policies. (5) Status Report of Defense Procurement Circulars. (6) Extension of DPC #23 (Items I, I-A, I-B). (7) Pen and Ink Change. (8) Equal Employment Opportunity. (9) Administration of Contracts with Canadian Contractors.

Each Defense Procurement Circular is designed to place new or changed policy or procedures in effect prior to publication of an Armed Services Procurement Regulation (ASPR) revision. ASPR subscribers will receive DPC's and ASPR revisions through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Engineers' Overseas Handbook. Designed to assist U.S. engineering firms in developing business abroad by providing a condensed source of information on market conditions in free world countries. Issued in looseleaf form with binder. 1965. 242 pp.
Catalog No. C41.6/9:En3 $2.25.

Guide for the Preparation of Project Master Plans (PMP). Issued by the Office of Naval Material, this instruction provides guidance for the preparation and implementation of Project Master Plans (PMP) in the management and execution of major projects within the Naval Material Support Establishment. 166 pp. il.
Catalog No. D101.22:550-44. $1.50

Inventory of Automatic Data Processing Equipment in the Federal Government. June 1965. Provides information on the number of electronic computers in use throughout the Federal Government. 1965. 365 pp.
Catalog No. PrEx 2.12:965 $2

Contracting for Construction and Architect-Engineering Services. Describes the policies and procedures dealing with the administration of contracts for construction and architect engineering services. It also explains the various types of contractors used and the method for selection of contractors and architect engineers. 1965. 12 pp.
Catalog No. Y 3.At7:2C 76/2/965 15¢

A Survey of Federal Government Publications of Interest to Small Business. From the vast output of booklets, pamphlets and leaflets published by the various Federal Government agencies, those likely to be of assistance to the small business sector are listed in this volume. 1965. 118 pp.
Catalog No. SBA 1.18/2:G74/965 45¢

Evaluation of a Contractor's Quality Program. Issued as Quality & Reliability Assurance Handbook H 50, this publication provides guidance to personnel responsible for the evaluation of a contractor's quality program when Military Specification MIL-Q-9858A is invoked in his contract. MIL-Q-9858A, "Quality Program Requirements," requires contractors to establish a quality program which will assure compliance with the requirements of their contracts. 1965. 35 pp.
Catalog No. D 7.6/2:50 30¢

Comptroller General Reports to Congress on Audits of Defense Contracts. Presents the hearings held before a subcommittee of the House Committee on Government Operations, 89th Cong. 1st sess., May 10-27; June 1-3; and July 8, 1965, on procedures and results of contract audit reports by the Comptroller General. 1965. 1,075 pp. il.
Catalog No. Y4.G74/7:D36/6 $3.25

Distributing Problems Affecting Small Business, Part 1, Franchising Agreements. Presents Part 1 of the hearings on distribution problems affecting small business held before the Subcommittee on Antitrust and Monopoly, Senate Committee on the Judiciary, 89th Cong. 1st sess., March 2-4, 1965. 1965. 496 pp. il.
Catalog No. Y4.J89/2:Sm 1/pt. $1.50

Publications that require remittance are available for purchase at U.S. Government Printing Office, Washington, D.C. 20402

Order AD-621 543 Focal Antibody Production by Transferred Spleen Cells in Irradiated Mice. Naval Radiological Defense Laboratory, San Francisco, Aug. 1965, 18 pp. $1.

Order AD-620 252 A Data Processing System for the Ballistrocardiogram. Naval Aviation Medical Center, Pensacola, Fla., Feb. 1965, 57 pp. $3.

Order AN-618 672 Microbiological Safety Bibliography. Army Biological Laboratories, July 1965, 81 pp. $3.

Order AD-615 814 Technical Report: The Physiological Effects of Argon, Helium and the Rare Gases. Union Carbide Corp., Linde Div., for the Office of Naval Research, May 1965, 76 pp. $3.

Order AD-617 518 Erythrocyte Biochemistry. Army Medical R&D Command, University of Virginia for Office of Surgeon General, June 1965, 159 pp. $5.

Order AD-619 015 Application of a Power Lubrication System to a Gas Turbine Engine. Fairchild Hiller Corp. for the Air Force, June 1965, 29 pp. $2.

Order AD-464 626 Development of Gas-Entrained Powder Lubricants for High Speed and High Temperature Operation of Spur Gears. Fairchild Hiller Corp. for the Air Force, May 1965, 99 pp. $4.

Order AD-620 294 Load Carrying Capacities of Gear Lubricants of Different Chemical Classes Based on Results Obtained with Wadd High Temperature Gear Machine Used With Induction Heated Test Gears. Air Force Aero Propulsion Lab., Wright-Patterson AFB, Ohio, April 1965, 47 pp. $2.

Order AD-620 329 The Stress Corrosion and Elevated Temperature Properties of Magnesium-Lithium-Silicon alloys. Army Frankford Arsenal, Philadelphia, Oct. 1964, 17 pp. $1.

Order AD-618 681 Effects of Alloying Upon Certain Properties of 55.1 Nitinol, Naval Ordnance Lab, White Oak, Md., May 1965, 42 pp. $2.

Order AD-619 075 First Seminar on Fatigue & Fatigue Design. Columbia University Institute for the Study of Fatigue & Reliability, for the Defense Department, Dec. 1963, 175 pp. $5.

Order AD-620 513 On the Mechanisms of Stress-Corrosion Cracking. Martin's Research Institute for Advanced Studies, Baltimore, for the Army, Aug. 1965, 66 pp. $3.

Order AD-619 373 Toward a General Methodolgy for Systems Evaluation. HRB Singer, State College, Pa., for the Navy, July 1965, 73 pp. $3.

Order AD-617 904 Some Developments in Management Science and Information Systems with Respect to Measurement in Accounting. Carnegie Institute of Technology, Pittsburgh, for the Navy, March 1965, 38 pp. $2.

Government research and development reports are available to science and industry at price indicated from:

Clearinghouse for Federal and
Scientific Information
Department of Commerce
Springfield, Va. 22151

Authorized DOD contractors and grantees may obtain these documents without charge from:

Defense Documentation Center
Cameron Station
Alexandria, Va. 22314

MEETINGS AND SYMPOSIA

FEBRUARY 1966

Eight Joint Industry-Military-Government **Packaging and Materials Handling** Symposium, Sheraton Park Hotel, Washington, D.C., Feb. 28-March 2. Sponsors: National Security Industrial Assn., Office of Secretary of Defense, Military Services, Department of Commerce, NASA, GSA and AEC. Contact: W. J. Monaghan, NSIA, Suite 800, 1030 15th St., N.W., Washington, D.C.

Interdisciplinary Aspects of Radioactive Energy Transfer Symposium, Feb. 24-26, Sheraton Hotel, Philadelphia, Pa. Sponsor: Office of Naval Research. Contact: Morton Cooper, Office of Naval Research (Code 438), Department of the Navy, Washington, D.C., telephone (Area Code 202) OXford 6-6839.

MARCH 1966

National Conference on **Space Maintenance and Extra Vehicular Activity**, March 1-3, at Meyer Motor Inn, Orlando, Fla. Sponsors: Air Force Propulsion Laboratory and the Martin Co. Contact: Mr. E. May (APFT), Air Force Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio, telephone (Area Code 513) 253-7771, ext. 27107.

Symposium on the **Coupling of Basic and Applied Corrosion Research**, March 21-22, National Bureau of Standards, Washington, D.C. and Gaithersburg, Md. Sponsors: Office of Naval Research, Naval Research Laboratory and the National Bureau of Standards. Contact: Dr. Richard C. Carlston, Office of Naval Research (Code 423), Department of the Navy, Washington, D.C., telephone (Area Code 202) OXford 6-1801.

Conference on **Functional Analysis**, March 28-April 1, at the University of California, Irvine, Calif. Co-sponsors: Air Force Office of Scientific Research and the University of California. Contact: R. G. Pohrer (SRMM), Air Force Office of Scientific Research, Tempo D, 4th St. and Independence Ave., S.W., Washington, D.C., telephone (Area Code 202) OXford 6-5248.

APRIL 1966

Second Symposium on **Marine Bio-Acoustics**, April 6-8, American Museum of Natural History, Central Park West at 79th St., New York City and Naval Training Device Center, Port Washington, N.Y. Sponsor: Naval Training Device Center. Contact: F. E. Wolf, Jr, Research Program Manager, Naval Training Device Center, Port Washington, N.Y., telephone (Area Code 516), PO 7-9100, ext. 550.

Conference on Ground-Based **Aeronomic Studies of the Lower Ionosphere,** April 11-15, Defense Research Telecommunications Establishment (DRTE), Ottawa, Canada. Co-sponsors: Air Force Cambridge Research Laboratories and DRTE. Contact: W. Pfister (CRUB), Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Mass., telephone (Area Code 617), CR 4-6100, ext. 3019.

Symposium on **Generalized Networks,** 14th in a series of international symposia organized by the Polytechnic Institute of Brooklyn, Microwave Research Institute, April 12-14, New York City. Sponsors: Air Force Office of Scientific Research, Office of Naval Research and the Army Research Office, Society for Industrial and Applied Mathematics and the Institute for Electrical and Electronics Engineers. Contact: Lt. Col. E. P. Gaines, Jr, (SREE), Air Force Office of Scientific Research, Tempo D, 4th St. and Independence Ave., S.W., Washington, D.C., telephone (Area Code 202) OXford 6-3671.

Twentieth Annual **Frequency Control** Symposium, April 19-21, Shelburne Hotel, Atlantic City, N.J. Sponsor: Army Electronics Laboratories. Contact: M. F. Timm, Solid State & Frequency Control Div., Army Electronics Laboratories, Fort Monmouth, N.J., telephone (Area Code 201) 535-1728.

Symposium on **Mathematical Aspects of Computer Science,** dates undetermined, New York City. Sponsors: Air Force Office of Scientific Research, Army Research Office-Durham, Institute for Defense Analyses, Assn. for Symbolic Logic and Assn. for Computing Machinery. Contact. Capt. J. Jones, Jr. (SRMA), Air Force Office of Scientific Research, Tempo D, 4th St. and Independence Ave., S.W., Washington, D.C. telephone (Area Code 202) OXford 6-1302.

MAY 1966

Symposium on **Electrode Processes,** May 1-6, Cleveland, Ohio. Co-sponsors: Air Force Office of Scientific Research and the Electrochemical Society, Inc. Contact: Lt. Col. M. D. Sprinkel (SRC), Air Force Office of Scientific Research, Tempo D, 4th St. and Independence Ave., S.W., Washington, D.C., telephone (Area Code 202) OXford 6-8706

Bionics Symposium 1966, May 3-5, Sheraton Hotel, Dayton, Ohio. Sponsors: Aerospace Medical Research Laboratory, Aerospace Medical Div.; and Avionics Laboratory, Air Force Research and Technology Div. Contact: Dr. H. L. Oeistreicher (MRBAM), Aerospace Medical Research Laboratory, Wright-Patterson AFB, Ohio, telephone (Area Code 513) 253-7111, ext. 3-6108.

Ninth **Navy Science** Symposium, May 5-6, Departmental Auditorium, Constitution Ave., between 12th and 14th streets, N.W., Washington, D.C. Sponsor: Office of Naval Research. Contact: Robert J Mindak, Conference Chairman, Office of Naval Research (Code 104), Department of the Navy, Washington, D.C., telephone (Area Code 202) OXford 6-4720.

Third Annual Symposium on Military **Oceanography,** May 11-13, at San Diego, Calif. Sponsor: Oceanographer of the Navy. Host: U.S. Navy Electronics Laboratory, San Diego. Contact: Office of the Oceanographer of the Navy, Washington, D.C. telephone (Area Code 202) OXford 8-3940.

Business Opportunities Conference To Be Held in Hawaii

A business opportunities conference will be held in Honolulu early in February to assist Hawaii's industrial and scientific community in developing state sources for Government contracts.

The two-day conference will be conducted by the Departments of Defense and Commerce, assisted by other Federal agencies including the Small Business Administration.

The conference, which is the first of its kind to be held in Hawaii, will meet Feb. 3-4 in Turner Hall, U.S. Army Reserve Armory, Fort Derussey, Honolulu.

The business opportunities and procurement conference activity is one of the Department of Defense programs conducted by the Directorate for Small Business and Economic Utilization, Office of the Assistant Secretary of Defense (Installations and Logistics), to develop and utilize capable and competitive sources, particularly small businesses.

CALENDAR OF EVENTS

Dec. 26-31: American Assn. for Advancement of Science Meeting, Berkeley, Calif.

Jan. 10-14: Society of Automotive Engineers Convention, Detroit, Mich.

Jan. 11-12: "Man's Extension Into the Sea, Symposium, Statler Hilton Hotel, Washington, D.C.

Jan. 13: 18th Pacific Coast Regional National Security Industrial Assn. Dinner, Los Angeles, Calif.

Jan. 17: National Aerospace Services Assn. Eighth Annual Army Aviation Contract Services Symposium, Statler Hilton Hotel, Washington, D.C.

Jan. 29-31: Fourth Annual Pinellas County Industrial and Aerospace Exhibition, St. Petersburg, Fla.

Jan. 30-Feb. 4: American Society of Civil & Structural Engineers Meeting, Miami Beach, Fla.

Jan. 31-Feb. 4: American Society of Civil Engineers Meeting, Miami Beach, Fla.

Feb. 2-4: West Coast Winter Convention on Military Electronics, Los Angeles, Calif.

Feb. 6-7: American Institute of Chemical Engineers Meeting, Dallas, Tex.

Feb. 10-11: Armed Forces Communications & Electronics Assn. Symposium, Washington, D.C.

Feb. 13-16: Radiation Research Society Meeting, Coronado, Calif

Feb. 17-19: Institute of Management Sciences Meeting, Dallas, Tex.

Feb 28-March 2: 8th Joint National Security Industrial Assn. Industry-Military-Government Packaging & Materials Handling Symposium, Washington, D.C.

March 3-4: DOD-National Security Industrial Assn. Advanced Planning Briefing for Industry, Boston, Mass.

March 9-10: DOD-National Security Industrial Assn. Advanced Planning Briefings for Industry, Atlanta, Ga.

March 16-17: DOD-National Security Industrial Assn. Advanced Planning Briefings for Industry, St. Louis, Mo.

March 21-24: Institute of Electrical & Electronic Engineers Exposition, New York City.

March 21-April 1: National Defense Seminar, Carbondale, Ill.

March 22-31: American Chemical Society Meeting, Pittsburgh, Pa.

March 23-26: Air Force Assn. Convention, Dallas, Tex.

March 27-April 2: American Society of Photogrammetry Meeting, Washington, D.C.

Air Force Picks Martin-Marietta, Boeing for SRAM Contract Definition

Air Force Secretary Harold Brown has selected the Martin-Marietta Corporation of Orlando, Fla., and The Boeing Company of Seattle, Wash., to proceed with the contract definition phase of the Short Range Attack Missile (SRAM) program.

Both firms will be awarded fixed-price contracts valued at about $2.75 million each. The competing contractors will submit further proposals. If a decision is made to go forward with SRAM, one contractor will be selected in late 1966 to continue the program.

The SRAM will be an air-to-surface attack missile with nuclear capability. It could be carried by the F-111 aircraft and would be adaptable to the late model B-52 aircraft.

Purpose of the contract definition phase is to verify the preliminary SRAM design and engineering and to set firm contract and management planning.

The SRAM program is managed by the Aeronautical Systems Division of the Air Force Systems Command at Wright-Patterson AFB, Ohio.

Comprehensive Study To Be Made of All DOD Hospitals in U.S.

The Department of Defense, with the assistance of outside consultants, is conducting a comprehensive study of DOD hospitals and outpatient clinics in the continental United States.

The study was ordered by Secretary of Defense Robert S. McNamara to improve the design and management of military hospitals, outpatient clinics and hospital management training programs.

The Military Departments now operate more than 250 hospitals and 450 dispensaries which have a capital investment of more than a billion dollars and employ about 1700,000 military and civilian personnel. The annual operating costs of these facilities and related medical services will exceed one billion dollars in FY 1966. It is essential that they be managed effectively in order to provide the best medical service at the lowest possible cost.

Secretary McNamara has established a Hospital Management Evaluation Committee to oversee the preparation of the study plan and the progress of the study, and to analyze the consultants' reports. The committee is headed by Thomas D. Morris, Assistant Secretary of Defense (Manpower).

The committee is expected to prepare a final report for transmittal to the Secretary of Defense in November 1966. This report will be a comprehensive plan of action and will outline long-range objectives to improve the overall management of the medical services and specific recommendations where results in a given area can be accomplished in a shorter period of time.

Contracts for preliminary studies have been signed with McDonnell Aircraft Corp., Electronic Equipment Div., St. Louis; Daniel, Mann, Johnson and Mendenhall, Los Angeles; Space-General Corp., Los Angeles; and Bolt, Beranek and Newman, Inc., Los Angeles.

The U.S. Army Medical and Research Development Command is executive agent for the study.

Navy Office of Material Publishes New Guides

The U.S. Navy's Office of Material has announced the names of two new publications which are available to business and industry representatives.

Titles of the new booklets are, "Survey of Procurement Statistics" NAVMAT P–4200 of June 1965 and "Selling to Navy Prime Contractors" NAVMAT P–1030 of October 1965.

Survey of Procurement Statistics provides selected statistics on Navy procurement as a reference in planning future policies. Requests for copies of this publication should be addressed to the Chief of Navy Material (MAT 215), Washington, D.C.

Selling to Navy Prime Contractors is a summary of Navy subcontracting programs, plus a directory of firms listed by state and general category of defense items produced with name and address of corporate official to be contacted for information of subcontract opportunities. It is available from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

New Civil Works Listing

(Continued from Page 16)

Neuse River. (MP) Falls Reservoir. $18,600,000.

New Bern. (HFC) Hurricane tidal barrier, $10,400,000.

Ocracoke Island. (HFC & BE) Beach stabilization & hurricane protection. $1,636,000.

NORTH DAKOTA

James River. (MP) Pipestem Reservoir. $3,083,000.

OHIO

Ashtabula Harbor. (N) Deepening harbor basin. $1,840,000.

Lorain Harbor. (N) Change in local cooperation requirements. $1,600,000.

Rocky River Harbor. (N) Channel deepening & widening. $235,000.

West Harbor. (N) Breakwater & access channels. $544,000.

Chagrin River. (FC) Breakwaters, channel improvements & levees. $2,200,000.

Hocking River Basin. (FC) Channel improvements at Athens. $4,520,000.

OKLAHOMA

Crutcho Creek. (FC) Channel improvements. $1,801,000.

Shidler Dam & Reservoir. (MP) $6,150,000.

OREGON

Chetco River. (N) Jetty extension, turning basin, access channel & deepening. $1,308,000.

Port Orford. (N) Breakwater extension. $696,000.

Tillamook Bay and Bar. (N) Rubble mound jetty. $9,000,000.

Grande Ronde. (MP) Lower Grande Ronde and Catherine Creek Reservoirs. $20,440,000.

John Day Lock and Dam. (FC) Acquisition of lands for a national waterfowl refuge. $706,000.

Willow Creek. (MP) Heppner Reservoir. $6,680,000.

PENNSYLVANIA

Chartiers Creek. (FC) Channel improvements. $12,207,000.

Sandy Lick Creek at Du Bois. (FC) Channel improvements. $1,654,000.

RHODE ISLAND

Cliff Walk. (BE) Protective structures. $340,000.

Providence River and Harbor. (N) Channel deepening & widening. $13,900,000.

Westerly. (HFC) Beach stabilization and dikes. $3,287,000.

SOUTH CAROLINA

Hunting Island Beach. (BE) Groin and beach replenishment. $319,000.

TEXAS

Chocolate Bayou. (N) Channel & salt water barrier. $1,254,000.

Houston Ship Channel (Green Bayou). (N) Deep draft channel & shallow draft extension. $470,000.

Trinity River. (MP) Comprehensive development of Trinity River Basin for navigation, flood control & other purposes. $83,000,000 (authorization limitation).

Buffalo Bayou (White Oak Bayou). (FC) Channel improvements. $1,800,000.

El Paso. (FC) Detention Dams, diversion dike and channels. $12,493,000.

Highland Bayou. (FC) Channel improvements. $3,500,000.

Sanders, Big Pine & Collier Creek. (FC) Road relocation at Pat Mayse Reservoir. $310,000.

Taylors Bayou. (FC) Channel improvements. $5.004,000.

VIRGINIA

Newport News Channel. (N) Anchorage areas. $7,095,000.

Newport News-Norfolk Harbor. (N) Deepening channel and anchorage areas. $25,600,000.

WEST VIRGINIA

Cheat River. (MP) Rowlesburg Reservoir. $133,548,000.

OTHER ATHORIZATIONS

Whitney Dam, Tex. (FC) Replacement of roads. $130,000.

Eel River, Calif. (FC) Reimbursement for protective works. $3,000.000.

Calumet Harbor and Railroad, Illinois and Indiana. (N) Protection for railroad bridges. $350,000.

NAVIGATION SURVEYS

San Francisco County, Calif. (beach erosion).
Intracoastal Waterway from the Caloosahatchee River to the Withlacoochee River, Fla.
Indian River County, Fla. (beach erosion).
Calumet River, Ill.
Lake Dauterive & Chareton Floodgate, La.
Gulf Intracoastal Waterway, La.
Jonesport Harbor, Maine.
Blue Hill, Harbor, Maine.

(Continued on Page 25)

INDUSTRY BRIEFS

The first operational training missions of the Roadrunner target missiles were flown recently at McGregor Range, N. M., in support of training Hawk missile crews. The Roadrunner was developed and produced for the U.S. Army by the Columbus Division of **North American Aviation, Inc.** . . . Reeves-Hoffman Division, **Dynamics Corporation of America,** received a commendation for its quality control on the Bullpup missile program . . . The **Ling-Temco-Vought, Inc.,** "Gray Eagle" trophy, given to the Naval aviator who has held his aviator designation longer than any other, was given to Lieutenant General Richard C. Mangrum, Assistant Commandant of the U.S. Marine Corps. General Mangrum became the 14th recipient of the honor and the first Marine to win it.

A working scale model of **The Boeing Company**'s Vertol Division tilt-float helicopter was displayed for the first time at the Sixth Annual Rescue Symposium held in Atlantic City. The design concept is the result of the Vertol Division design feasibility study under contract to the U.S. Navy Bureau of Naval Weapons . . . A NATO briefing team, comprised of nine military officers representing eight NATO countries, toured the **McDonnell Aircraft Corporation** plant in St. Louis.

At a brief "roll-out" ceremony at its Von Karman Center, **Aerojet-General Corporation** turned over its first battle ready "underwater missile," the Mark 46 Torpedo, to the U.S. Navy . . . The U.S. Air Force Air Rescue Service accepted the first new combat-equipped HH-3C long range recovery helicopter from **Sikorsky Aircraft.** In jungle camouflage paint, the helicopter demonstrated rescue techniques developed especially for combat crew recovery operations.

Northrop Corporation delivered the last two of a squadron of 12 F-5 fighters scheduled for Vietnam duty to Williams AFB, Ariz. . . . **Aerospace Industries Association** has completed its 1965 edition of the Directory of Foreign Helicopter Operators . . . Rocketdyne dealt with a total of 6,507 small business firms during FY 1965—92 more than the previous fiscal year. Of the more than 8,500 companies with which the **North American Aviation, Inc.,** division did business, 77.7 per cent were small business firms . . . **Martin Company** has completed the manufacture of the first "boilerplate" test model of the Air Force's newest spacecraft—the PRIME SV-5D lifting body . . . Air Force has accepted the AN/TRC-87 Communications System from **Motorola, Inc.**

The Naval Research Laboratory, Washington, D.C., awarded first-time contracts to 36 small business firms between May and August of this year. One of the awards went to the year-and-a-half old firm of **Space and Tactical Systems Corporation** in Burlington, Mass. The contract was awarded after a larger firm failed to perform satisfactorily under a larger contract for an item to serve the same function . . . The U.S. Army Engineer District, Kansas City, negotiated contracts with five small business firms for mosquito control spraying in parts of 11 Missouri counties, which were included in a major disaster area as a result of flooding. The District's Mobile office awarded 34 contracts during FY 1964 and FY 1965 to small business firms for development of recreational areas at three reservoir projects—Lake Seminole at Jim Woodruff Lock and Dam, Chattahoochee, Fla.; Lake Sidney Lanier at Buford Dam, Buford, Ga.; and Allatoona Reservoir Recreational Area near Cartersville, Ga.

Gene K. Beare, President of **Sylvania Electric Products, Inc.,** has been elected President of the **National Electric Manufacturers Association** . . . **Ryan Aeronautical Company** has begun design and production of a new supersonic Firebee for the Navy . . . Officers of the Spanish Armed Forces were recent visitors at **Northrop Corporation**'s Norair Division. A high point in the visit was taking a tour of the F-5 assembly line. The visit was part of a nation-wide tour of military installations and industry facilities sponsored by the Air Force's Strategic Air Command.

Vitro Laboratories is working on what it believes to be the first "user need" study ever made in the field of oceanographic literature for the Naval Oceanographic Office . . . **Raytheon Company**'s Submarine Signal Division recently delivered to the Navy the first of 10 AN/BQQ-1 integrated sonar systems that will be delivered over the next year . . . A sharpshooting USAF F-104 Starfighter pilot from the 319th Fighter Interceptor Squadron won the **Lockheed-California Company** "Top Gun" Award in William Tell 1965, the Air Force Worldwide Weapons Meet . . . **Bendix Corporation**'s Mishawaka Division ascribes its winning of a three-year contract of the Talos from the Navy through cost reductions effected by its Zero Defects program . . . A new Pillow Tank production facility will be established at the Arizona Division by **Goodyear Aerospace Corporation** due to the acceptance of the collapsible containers by the military forces.

The Navy Resale Program

(*Continued from Page 15*)

precepts of customer demand and quality and price of merchandise.

Retail prices of MSTS exchange merchandise are controlled by a profit limitation. The overall net profit goal for each exchange is approximately 10%, and at no time is it to exceed 12% or be less than 8%. These profits are used exclusively to provide necessary welfare and recreation activities for personnel embarked on MSTS vessels.

Commissary Stores.

Commissary stores are the second largest program, in terms of annual sales, of the Navy Resale System. As the name implies, commissary stores are essentially food stores selling groceries, meat and produce both in continental United States and overseas.

Current regulations authorize the stocking of 1,850 line items, including 150 line items reserved for vendor prepackaged meat. Emphasis is placed on providing a reasonable selection of standard food products and a limited range of household items, principally in detergent and bulk paper goods items.

Navy commissary stores may not stock items for the benefit of a few individuals, or gourmet type items. They may stock only those items and selections for which there is a substantial and recurring demand.

Procurement of required stock for commissary stores is usually made from commercial sources on Defense Supply Agency Brand Name Supply Bulletins and on contracts negotiated by Regional Headquarters, Defense Personnel Support Center. Some subsistence items having a resale demand may be transferred from local supply departments. If products desired are not on contract or bulletin, or if the same or lower price is offered in the local trade area, local procurement is made, but cannot exceed $2,500 per order. Local purchase, after reasonable competition from qualified suppliers in local trade area, is usually made for such products as dairy items, meat, produce, bread, rolls, ice cream and similar items.

Resale Item Selection Boards are not used in the Navy. However, some stores may have informal merchandise councils of key personnel to assist and advise the officer in charge in selecting new items. Patron "Want Slips" are used extensively to keep abreast of the Navy family's desires for items not presently carried in the store.

Vendor representatives calling on stores should make advance appointments and avoid lengthy presentations. Descriptive literature or dummy samples of container or package are desirable for visual presentation. While samples are not prohibited, they are not encouraged. Preferred policy is to obtain introductory voluntary price reductions in lieu of sample merchandise for patrons. Information desired on the product includes:

- What's new about the item? Any special features or advantages to similar items now available?
- Nationally advertised or local promotion campaigns?
- Guaranteed sales aspect, if item is of seasonal nature?
- Minimum order and delivery time?
- Sales response at other service commissaries or commercial stores where introduced?

Ship's Stores Afloat.

Ship's stores afloat—as we see them today on 675 ships—range from tugboat to the guided missile cruiser and destroyer and a nuclear-powered super aircraft carrier. All procurement and inventories for Ship's stores afloat are financed by appropriated funds held in a revolving account called the Navy Stock Fund.

The scope of the retail management job and the time and attention devoted to merchandising varies as much as the size and complexity of operations in individual ships. On larger ships, where the Supply Officer has several officer assistants, one officer is usually designated as the Ship's Store Officer, or Sales Officer, and has primary duty in the management and operation of retail stores and service activities, i.e., ice cream fountains, vending machines, dry cleaning plants, laundries, barber shops, cobbler shops and tailor shops.

On board smaller ships, however, the Supply Officer does not have an officer assistant and frequently only a very limited number of experienced senior petty officers are assigned to the resale function.

To assist commands in stocking the authorized items, the Navy Ship's Store Office sponsors several publications. One is the contract bulletins issued by Navy Purchasing Offices, New York and London, and Naval Supply Centers, Oakland, Calif., and Pearl Harbor. The bulletins list the most popular items for which recurring demand is experienced.

The second publication is the Ship's Store Afloat Catalog, which is published by the Navy Ship's Store Office. The same buyers who explore the market for Navy exchanges select and list in this catalog the best buys for the categories of authorized items not covered by the area contract bulletins. It is not the intent of the Navy Ship's Store Office to limit procurement to items in either of these two publications. However, considering the limitations of space and the inability of the average afloat resale personnel to judge the quality of material offered by various salesmen, ships are advised to limit procurement to these publications insofar as practical.

The Navy Ship's Store Office also publishes a third procurement guide, a Ship's Store Afloat Requisitioning, Load List and Shopping Guide. Part "A" of this publication contains a list of the 10 most popular items which are maintained on all quarterly contracts and in fleet issue ships around the world. This permits maximum service and maximum satisfaction to the greatest per cent of ship's company with the fewest items possible.

Part "B" of this publication contains a list of low issue, low cost and low bulk items which are of a necessity or semi-necessity nature. These are the type items that each ship will be expected to carry to last the duration of a deployment.

Part "C" of the publication contains items of a semi-luxury nature; for example, radios, watches, cameras, etc. These are higher price items that are available from the Ship's Store Afloat Catalog and may be procured on a special order basis.

Systems Policies.

The Navy Resale System has some broad policies or philosophic guidelines. Here are a few:

- Service to the customer is primary—profit is secondary.
- In negotiating with vendors, the policy is to require all vendors to sell to activities at the lowest price at which they are selling to any of their customers.
- The policy of nationally known brand name products is promoted because this is a world-wide operation. However, regional products may be procured locally as required.
- The pricing policy is standard world-wide. The sailor pays the same price for an item whether he is stationed in Bangkok, Thailand, or Rota, Spain.
- It obtains and utilizes the most modern business techniques.

The Future.

The Navy Resale System has grown from a rather small and simple beginning to encompass a complex world-wide business that still continues to grow. In light of this expansion, the Navy Ship's Store Office will continue to develop new horizons to further improve on all four programs. Some of the most significant areas are:

- Improvement of facilities.
- Recruitment and training of personnel.
- Better management techniques.
- Increased use of ADP (Automatic Data Processing) equipment.

The System will continue to provide the American sailor with convenient and reliable places to fulfill his requirement. It will try to help raise his standard of living as much as possible by making available to him quality merchandise at the lowest possible cost. This, plus the recreation facilities provided from profits, contributes to morale, improvement and retention of trained and qualified personnel to assure the sea power required in today's, and maybe tomorrow's, world.

Procurement Career Program

(*Continued from Page 19*)

which should be filled only by civilian personnel. This identification should provide procurement personnel a clearer picture of their career progression potential and, in certain instances, a greater motivation for mobility throughout the procurement field or between activities.

An executive agent will be selected for those phases of the civilian program which should be automated. Automation should be applied to the maximum extent possible. This will provide a central inventory and referral system for all civilian procurement personnel.

Each Military Department, the Defense Supply Agency and other agencies must periodically evaluate and inspect the operation of the career management program within its jurisdiction and make an annual report to the Assistant Secretary of Defense (Manpower), who will coordinate with the Assistant Secretary of Defense (Installations and Logistics).

Greater Opportunities Provided.

The procurement career program, then, is designed to improve procurement management and to assure that only experienced and capable civilians and/or military are assigned to the top key procurement management jobs within the Defense Department. This is to be accomplished by the establishment of procedures or techniques that will encourage more mobility for the civilian force and require more extensive procurement experience for military officers assigned to the top billets. The program seeks to provide greater advanced educational and training opportunities; improved personnel selection and assignment procedures; broad base of understanding by assignment in "related functional experience;" identification of key positions which will be only military and which will be only civilians; automation of the system to the maximum practical extent; and continuous monitoring and evaluation of the system by both the Military Department involved and by the Office of the Secretary of Defense.

Procurement Clinic Set for Salt Lake City

Procurement specialists from the Military Departments, the Defense Supply Agency and the Department of Commerce will be on hand to assist business and scientific firms interested in doing business with the Department of Defense during a procurement clinic to be held in Salt Lake City, Utah, Jan. 14.

For further information on the clinic, which is being sponsored by the Salt Lake City Chamber of Commerce, contact General Max Rich, Executive Secretary, Salt Lake City Chamber of Commerce, P.O. Box 329, Salt Lake City, Utah 84110.

Two-Step Formal Advertising

(*Continued from Page 3*)

not be evident from the technical proposals. Here is where we enjoy a most unique advantage from this form of formal advertising; we can clarify the technical proposals with the bidders and subsequently accrue the advantages of formal advertising with regard to price.

In addition to defining specifications, the Government-industry dialogue is used to bring marginal proposals up to an acceptable status. The contracting officer will make every reasonable effort to obtain clarification or additional information if he believes that he can bring a proposal action on the part of the contracting up to par. This is not a magnanimous officer. His objective is to increase competition.

The Government should only have to "do the two-step" once for a given requirement. As the specification is defined in step one, the technical/contracting team develops a sufficiently descriptive and not unduly restrictive statement of the Government's requirement, including an adequate technical data package, so that subsequent procurements may be made by conventional formal advertising. This is important because two-step takes a little longer.

As much as the Government would like to see all bidders remain in the running with acceptable technical proposals, some drop out. Unsuccessful bidders are notified and told, in general terms, why their proposals were unacceptable, e.g., that rejection was based on failure to furnish sufficient information or on an unacceptable engineering approach.

Now, in step two, the Government is ready to buy. All of the conditions that need to be present for the use of formal advertising prevail, including adequate specifications. Only successful step one bidders are invited to put a price tag on their proposals in step two and the Invitation For Bid states that these must be the same proposals that were accepted by the Government in step one.

Attention, prospective subcontractors! A list of the firms who have been invited to bid in step two is published in the *Commerce Business Daily* for your benefit. Here is an opportunity for you to take the initiative. Can you help step two bidders to produce what Uncle Sam needs?

As in conventional formal advertising situations, the award in step two will be made to the responsive and responsible bidder who offers the most advantageous buy to the Government, price and other factors considered.

Here is a list of some of the items that the Navy has purchased via two-step formal advertising.

- External power monitors.
- Hydraulic test stands.
- Telegraph signal analyzers.
- Machine tools.
- Submarine batteries.
- Propulsion equipment.
- Various electronics material including radar, sonar and radio equipment.

A special training course in two-step formal advertising is being developed in the Department of Defense, and procurements proposed for negotiation are being monitored for possible channeling to the two-step method. There is no doubt that two-step will be with us for a long time—as long as we have complex buys with indefinite specifications; as long as there is a need for some discussion of the technical aspects of our procurements while assuring the full benefits of the formal advertising approach.

Two-step formal advertising is but one of the many flexible purchasing techniques the Navy employs in the market place in order to effectively match the method of procurement with the nature of the requirement. The result is that more and better equipment is made available to support Navy ships and aircraft responding to the many and varied challenges that they face throughout the world.

New Civil Works Listing

(*Continued from Page 23*)

Popponesset Bay, Mass.
Marquette County, Mich.
Gulfport Harbor, Miss.
Great & Little Bays and tributaries, N.H.
Niagara River, N.Y.
Dickinson Bayou, Tex.
Manchester Harbor, Wash.
Lake Michigan Shoreline, Milwaukee County, Wis. (beach erosion).
Great Lakes & St. Lawrence Seaway: Deicing investigation study.
Chesapeake Bay Study.

FLOOD CONTROL SURVEYS

All streams flowing into the sounds of North Carolina betwen Cape Lookout and the Virginia line except those portions of the Neuse, Pamlico and Roanoke Rivers above the [illegible]uarine reaches.

All streams which drain directly into the Pacific Ocean from San Mateo County, Calif.

Big Mineral Creek, Tex., particularly construction of a highway bridge.

Coasts of Washington, Oregon and California to determine advisability of protection work against storm & tidal waves.

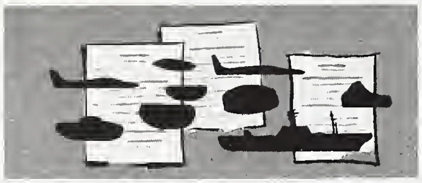
Watersheds of streams in: California which drain directly into the Pacific and of streams, washes, lakes and tributaries, which drain areas in the eastern part of California; the Pacific Northwest which drain directly into the Pacific along the coast of Washington & Oregon; the Western United States which drain areas of the great basin region of Oregon, California, Nevada, Utah, Idaho and Wyoming; the North and South Atlantic Regions.

Grand (Neosha) River, Oklahoma and Kansas (including navigation).

Arkansas River & tributaries at and above Tulsa, Okla.

Hatchie River & tributaries, Tennessee and Mississippi.

Mississippi River, north of Dubuque, Iowa.
Kaneohe-Kailua area, Oahu, Hawaii.
Terrebonne Parish, La., (water supply).
Southeasern Michigan study.
Rio Grande and tributaries.
Colorado River and tributaries above and below Lees Ferry, Ariz.
Boyer River, Iowa.
Keokuk, Iowa.
Black Hawk Creek, Iowa.
Mount Vernon, Ind.
Orange Lake Basin, Fla.
Mayfield Creek, Ky.
Spoon River, Ill.
Verdigris River, Kan.
Sanderson, Tex.
Abbeville, S.C.
New York State Study.
San Francisco Bay Study.
Irondequoit Creek, N.Y. and tributaries including Allens Creek, N.Y.



DEFENSE PROCUREMENT

Contracts of $1,000,000 and over awarded during month of November 1965:

DEFENSE SUPPLY AGENCY

2—**Oscar Mayer & Co.**, Madison, Wis. $1,944,065. 1,212,662 pounds of canned sliced bacon. Madison. Defense Personnel Support Center, Philadelphia.

—**C. M. London Co.**, New York City. $1,429,578. 860,000 yards of wind resistant nylon cloth. Greenville, S.C. and Bradford, R.I. Defense Personnel Support Center, Philadelphia.

—**Brooks & Perkins**, Detroit, Mich. $1,361,328. 5,623 aircraft cargo pallets. Cadillac, Mich. Defense General Supply Center, Richmond, Va.

3—**Electro-Plastic Fabrics, Inc.**, Pulaski, Va. $1,950,900. 325,150 coated nylon twill ponchos. Pulaski. Defense Personnel Support Center, Philadelphia.

—**Monsanto Co.**, St. Louis. $1,334,400. 240,000 gallons of herbicide. St. Louis. Defense General Supply Center, Richmond, Va.

—**Marshall Produce Co.**, Marshall, Minn. $2,213,070. 1,835,379 pounds of dried eggs. Marshall. Defense Personnel Support Center, Philadelphia.

9—**Kaiser Steel Corp.**, Oakland, Calif. $1,599,455. 1,645,022 steel fence posts. Fontana, Calif. Defense Construction Surply Center, Columbus, Ohio.

—**Oscar Mayer Co.**, Madison, Wis. $1,441,775. 1,030,584 29-ounce cans of ham chunks. Madison. Defense Personnel Support Center, Philadelphia.

—**The Defense Personnel Support Center**, Philadelphia, is issuing these contracts for tropical combat boots: **Safety First Shoe Co.**, Nashville, Tenn. $2,708,732. 273,312 pairs. Huntsville, Ala.; **Hi-Pals Footwear**, Waynesville, N.C. $1,116,960. 104,000 pairs. Darien, Ga.; **Bata Shoe Co.**, Belcamp, Md. $3,020,053. 308,376 pairs. Belcamp.

10—The Defense Fuel Supply Center, Alexandria, Va. has awarded the following contracts for gasoline and fuel oil: **Gulf Oil Corp.**, Houston, Tex. $3,080,018 **American Oil Co.**, Chicago. $2,588,517. **Socony Mobil Oil Co.**, New York City, $2,345,900.

12—**Prestex, Inc.**, New York City. $1,531,329. 1,528,000 yards of cotton duck cloth. Cuero, Tex.; Dalton, Ga.; Memphis, Tenn.; and Louisville, Ky. Defense Personnel Support Center, Philadelphia.

—**Mt. Vernon Mills, Inc.**, Baltimore. $2,192,630. 3,000,000 yards of cotton duck cloth. Memphis, Tenn.; Tallassee, Ala.; and Concord, N.C. Defense Personnel Support Center, Philadelphia.

16—**Sierra Engineering Co.**, Sierra Madre, Calif. $1,607,105. 18,428 helmets for combat vehicle crews. Sierra Madre. Defense Personnel Support Center, Philadelphia.

17—**John Ownbey Co.**, Knoxville, Tenn. $1,225,996. 182,440 nylon-cotton sateen field coats with hoods. Knoxville. Defense Personnel Support Center, Philadelphia.

—**Alpha Industries**, Knoxville, Tenn. $2,762,132. 454,100 nyon-cotton sateen field coats with hoods. Knoxville. Defense Personnel Support Center, Philadelphia.

19—The Defense Fuel Supply Center, Alexandria, Va. has awarded the following contracts for avaition fuel: **Texas City Refining Inc.**, Texas City, Tex. $3,005,248 23,520,000 gals.; **Philips Petroleum Co.**, Bartlesville, Okla. $3,027,526. 22,902,000 gals and 98,000 fals (Grade 80/87); **Tidewater Oil Co.**, Los Angeles. $2,569,717. 17,640,000 gals.; **American Oil Co.**, Chicago. $2,405,707. 17,310,000 gals.; **Union Oil Co. of Calif.**, Los Angeles. $1,436,866. 9,702,000 gals.; **Shamrock Oil & Gas Corp.**, Amarillo, Tex. $1,113,102. 8,652,000 gals.; **Socony Mobil Oil Co.**, New York City. $1,116,864. 13,440,000 (JP-4 jet fuel); **Richfield Oil Corp.**, Los Angeles. $8,068,319. 54,600,000 gals.;**Socony Mobil Oil Co.**, New York City. $7,409,051. 55,066,600 gals. and 2,744,000 gals. (grade 80/87); **Standard Oil Co.**, Louisville, Ky. $6,520,269. 50,000,000 gals.; **Cities Service Oil Co.**, New York City. $5,772,121. 58,447,080 gals.; **Humble Oil & Refining Co.**, Houston, Tex. $5,207,660. 37,119,000 gals.; **Sinclair Refining Co.**, New York City. $5,207,136. 39,700,000 gals.; **Standard Oil Co., of Calif.**, San Francisco, $5,185,821 35,879,000 gals and 155,000 gals (Grade 80/87); **Tidewater Oil Co.**, New York City. $4,549,143. 34,200,000 gals.; **Continental Oil Co.**, Houston, Tex. $3,669,923. 28,035,800 gals.

—**S. I. Handling Systems, Inc.**, Easton, Pa. $1,739,434. Manufacture & Installation of a mechanized materials handling system at the Defense Depot, Ogden, Utah. Defense Depot, Ogden.

—**Marathon Oil Co.**, New York City. $1,005,750. 270,000 barrels of diesel fuel oil. Defense Fuel Supply Center, Alexandria, Va.

23—**Eastman Kodak Co.**, Rochester, N.Y. $1,008,294. 16,880 rolls of aerial photographic film. Rochester. Defense General Supply Center, Richmond, Va.

24—The Defense Fuel Supply Center, Alexandria, Va., has issued the following contracts for petroleum **Standard Oil Co. of Calif.**, San Francisco. $5,218,680. 1,936,000 barrels; **Richfield Oil Corp.**, Los Angeles. $3,521,610. 1,330,000 barrels; **Socony Mobil Oil Co., Inc.**, New York City. $2,538,040. 812,000 barrels; **Union Oil Co. of Calif.**, Los Angeles. $1,324,792. 328,000 barrels; **Shell Oil Co.**, New York City. $1,098,850. 350,000 barrels; **Texaco Inc.**, New York City. $1,781,760. 438,000 barrels.

29—The following contracts for petroleum products have been awarded by the Defense Fuel Supply Center, Alexandria, Va.: **Gulf Oil Corp.**, Houston, Tex. $5.158,596. 22,828,000 gallons of fuel oil, diesel and kerosene and 20,460,000 gallons of motor gasoline; **Atlantic Refining Co.**, Philadelphia, $1,193,778. 930,000 gallons of fuel oil and 8,705,000 gallons of motor gasoline.

—The following contracts for JP-4 jet fuel have been awarded by the Defense Fuel Supply Center, Alexandria, Va.; **Socony Mobile Oil Co.**, New York City. $1,899,606. 22,680,000 gals.; **Atlantic Refining Co.**, Philadelphia. $2,059,700. 23,000,000 gals.; **Sun Oil Co.**, Philadelphia. $1,602.483. 16-537,500 gals.: **Signal Oil Co.**, Houston, Tex. $1,298,808. 15,120,000 gals.

30—**Delta Petroleum Co.**, New Orleans. $1,996,194. 5,343,249 gallons of aircraft lubricating oil. Defense Fuel Supply Agency, Alexandria, Va.

—**Refiners Marketing Co.**, Los Angeles. $1,163,354. 2,430,240 gallons of aircraft lubricating oil. Defense Fuel Supply Center, Alexandria, Va.

—**Monsanto Co.**, St. Louis. $1,334,400. 240,000 gallons of herbicide. Defense General Supply Center, Richmond, Va.

ARMY

1—Air Logistics Corp., Pasadena, Calif. $1,291,154. Air transportable fueling systems. Pasadena. Army Mobility Equipment Center, St. Louis.

—**Zeller Corp.**, Defiance, Ohio. $3,224,312. 20mm projectiles. Defiance. Frankford Arsenal, Philadelphia.

—REDM Corp., Wayne, N.J. $3,079,616. Wayne. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Bulova Watch Co.**, Providence, R.I. $3,199,100. Ordnance items. Providence. Ammunitien Procurement & Supply Agency, Joliet, Ill.

—Skagit Corp., Sedro Woolley, Wash. $3,144,820. Cartridge cases. Sedro Woolley. San Francisco Procurement Dist., Oakland, Calif.

—Raytheon Co., Lexington, Mass. $1,083,491. Ordnance items. Bristol, Tenn. Ammunition Prccurement & Supply Agency, Joliet, Ill.

—**Hupp Corp.**, Canton, Ohio. $2,152,307. Fuel engine assemblies for 2½ and 5-ton trucks. Canton. Army Tank Automotive Center, Warren, Mich.

—**Norris Thermador Corp.**, Los Angeles. $2,177,750 and $2,176,146. 105mm cartridge cases. Vernon, Calif. Los Angeles Procurement Dist., Pasadena, Calif.

—**Firestone Tire & Rubber Co.**, Akron, Ohio. $4,568,622. 106mm projectiles with fin assemblies. New Bedford, Mass. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Temco, Inc.**, Nashville, Tenn. $3,812,487. 106mm projectiles with fin assemblies. Nashville. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**LTV Electrosystems, Inc.**, Greenville, Tex. $1,213,500. Classified Electronics equipment Greenville. Army Electronics Command, Fort Monmouth, N.J.

—**Amron Corp.**, Waukesha, Wis. $1,637,500. Ordnance items. Waukesha. Frankford Arsenal, Philadelphia.

—**Union Carbide Corp.**, New York City. $1,620,248 and $1,072,207. Batteries for tactical radio sets (AN/PRC-25, 8,9, and 10). New York City. Electronics Command, Philadelphia.

2—**Philco Corp.**, Philadelphia. $1,051,900. Electronic equipment. Philadelphia. Army Electronics Command, Fort Monmouth, N.J.

—**Olin Mathieson Chemical Corp.**, E. Alton, Ill. $1,197,000. 7.62mm ball and cartridge tracers. E. Alton. Frankford Arsenal, Philadelphia.

3—**General Dynamics Corp.**, Pomona, Calif. $1,884,443. FY 66 R&D efforts on REDEYE. Pomona. Los Angeles Procurement Dist., Pasadena, Calif.

—**Honeywell, Inc.**, Tampa, Fla. $3,000,000. Classified electronic equipment. Tampa. Army Electronics Command, Fort Monmouth, N.J.

4—R. E. Dailey, Detroit. $1,843,967. Work on Brookville Reservoir Project. Brookville, Ind. Detroit. Engineer Dist., Louisville, Ky.

—AKWA-Downey **Construction** Co., Milwaukee, Wis. $1,399,500. Furnish and install instrumentation and communication cables for launch complex 39. Phase II, at the Kennedy Space Center, Merritt Island, Fla. Engineer Dist., Merritt Island, Fla.

—**Albion Malleable Iron Co.**, Albion, Mich. $1,333,309. Components for 2.75-inch rockets. Albion. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Chamberlain Corp.**, Waterloo, Iowa. $2,852,720. 2.75-inch rocket components. Waterloo. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Olin Mathieson Chemical Corp.**, New Haven, Conn. $2,276,034 and 2,845,388. Ordnance items. New Haven. Frankford Arsenal, Philadelphia.

5—**Guy H. James Construction Co.**, Oklahoma City, Okla. $3,981,571. Work on Broken Bow Okla., Reservoir Project. Engineer Dist., Tulsa, Okla.

—**Western Contracting Corp.**, Sioux City, Iowa. $1,797,304. Work on Calcasieu River and Pass Project. Cameron, La. Engineer Dist., New Orleans.

8—**American Gyroscope Makers,** Pelham Manor, N. Y. $1,161,040. Preproduction evaluation of technical and telescope mounts. Bronx, N. Y. Frankford Arsenal, Philadelphia.

—**Halvorson-McLaughlin Constructors,** Spokane, Wash. $13,623,000. Construction of a 550-bed hospital at the Presidio of San Francisco. Engineer District, Sacramento, Calif.

—**Atwood Vacuum Machine Co.,** Rockford, Ill. $1,292,068 and $2,441,048. Metallic belts for 20mm cartridges. Rockford. Frankford Arsenal, Philadelphia.

—**Supreme Products Corp.,** Chicago. $2,481,169. Ordnance items. Chicago. Frankford Arsenal, Philadelphia.

10—**Firestone Tire & Rubber Co.,** Akron, Ohio. $1,022,190. Tires for 2½-ton trucks. Akron. Army Tank Automotive Center, Warren, Mich.

—**Norris Thermador Corp.,** Vernon, Calif. $1,137,908. 105mm tracer projectiles. Vernon. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Lockheed Shipbuilding & Construction Co.,** Seattle, Wash. $15,637,975. Work on Blue River Reservoir Project. Eugene, Ore. Engineer Dist., Portland, Ore.

—**Airport Machining Corp.,** Martin, Tenn. $1,508,650. Ordnance items. Union City, Tenn. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**American Machinery Company of Texas,** Fort Worth, Tex. $1,683,780. Ordnance items. Fort Worth. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Zeller Corp.,** Defiance, Ohio. $1,495,453. Ordnance items. Defiance. Frankford Arsenal, Philadelphia.

—**Bell Helicopter Co.,** Hurst, Tex. $9,838,200. UH-1 helicopter production facilities. Hurst. Army Aviation Command, St. Louis.

12—**Williamson Co.,** Madison, Ind. $1,192,129. Modifications to aircraft engine shipping containers. Madison. Edgewood Arsenal, Md.

—**Norris Thermador Corp.,** Los Angeles, $1,989,307. Ordnance items. Vernon, Calif. Los Angeles Procurement Dist., Pasadena, Calif.

—**TRW, Inc.,** Redondo Beach, Calif. 6,500,000. Design, development and fabrication of test vehicles, and to conduct a flight test program over an instrumental range. Redondo Beach. Army Missile Command, Huntsville, Ala.

—**Lehigh, Inc.,** Easton, Pa. $1,833,991. Ordnance items. Easton. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Boeing Co.,** Morton, Pa. $1,100,000. Modification of CH-47A helicopters to an armed and armored configuration. Morton. Army Aviation Command, St. Louis.

15—**Sylvania Electric Products,** Mountain View, Calif. $2,949,000. Research and development in electronic warfare. Mountain View. Army Electronics Command, Fort Monmouth, N. J.

—**R. M. Wells Co.,** Quanah, Tex. $2,998,100. Construction of a composite medical facility at Cannon AFB, N.M. Engineer Dist., Albuquerque, N. M.

—**Norris Thermador Corp.,** Los Angeles. $2,295,878. Ordnance items. Vernon, Calif. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Martin-Marietta,** Orlando, Fla. $4,750,000. Production on the Pershing missile system for FY 1966. Orlando. Army Missile Command, Huntsville, Ala.

—**Remington Arms, Inc.,** Bridgeport, Conn. $1,171,832. Ordnance items. Bridgeport. Frankford Arsenal, Philadelphia.

—**Olin Mathieson Chemical Corp.,** E. Alton, Ill. $1,925,454. Ordnance items. E. Alton. Frankford Arsenal, Philadelphia.

16—**Ryan Aeronautical Co.,** San Diego, Calif. $1,326,000. Flight testing of the XV-5A aircraft; incorporating various research modifications; overhauling certain aircraft components and training government personnel. Edwards AFB, Calif. and San Diego. Army Aviation Materiel Laboratories, Fort Eustis, Va.

17—**Raytheon Co.,** Lexington, Mass. $1,390,904. Ground support equipment for the HAWK missile system. Waltham and Andover, Mass. Army Missile Command, Huntsville, Ala.

18—**I. D. Precision Components, Corp.,** Jamaica, N. Y. $1,766,014. Ordnance items. Gadsden, Ala. and Jamaica. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Olin Mathieson Chemical Corp.,** E. Alton, Ill. $1,949,947. Ordnance items. E. Alton. Edgewood Arsenal, Md.

19—**Mason & Hanger, Silas Mason Co.,** Lexington, Ky. $3,404,400. Ordnance items. Burlington, Iowa. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Harvey Aluminum Sales,** Torrance, Calif. $12,856,033. Ammunition. Milan, Tenn. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Olin Mathieson Chemical Corp.,** New York City. Ordnance items. Charlestown, Ind. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Chamberlain Corp.,** Scranton, Pa. $2,553,509. Ordnance items. Scranton. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Newport News Shipbuilding & Dry Dock Co.,** Newport News, Va. $1,417,300. Design, manufacture & delivery of 2 turbines for the West Point Dam Project. Design & manufacture will be done at Newport News. Delivery will be made to West Point, Ga. Engineer District, Savannah, Ga.

—**Firestone Tire & Rubber Co.,** Akron, Ohio. Rubber track shoe assemblies for M-60 tanks. Noblesville, Ind. Army Tank Automotive Center, Warren, Mich.

—**Canadian Commercial Corp.,** Ottawa, Ontario, Canada. $1,858,066. Ordnance. West Ingersoll, Ontario. Ammunition Procurement and Supply Agency, Joliet, Ill.

—**General Electric,** Burlington, Vt. $1,898,000. M5 sub-systems & repair parts. Burlington. Army Weapons Command, Rock Island, Ill.

—**General Electric,** Burlington, Vt. $8,952,250. (Air Force funds) 20mm guns and gun pods. Burlington. Army Weapons Command, Rock Island, Ill.

—**Sylvania Electric Products, Inc.,** Emporium, Pa. $3,715,425. Electron tubes. Emporium. Harry Diamond Laboratories, Washington, D. C.

—**Raytheon Co.,** Missile Systems Div., Bristol, Tenn. $7,461,073. Mortar fuzes. Bristol. Harry Diamond Laboratories, Washington, D. C.

—**Motorola,** Chicago. $7,515,677. Mortar fuzes. Chicago. Harry Diamond Laboratories, Washington, D. C.

22—**AVCO Corp.,** Everett, Mass. $1,967,878. A research program under (an Advanced Research Projects Agency program) Project DEFENDER. Everett. Army Missile Command, Huntsville, Ala.

—**General Dynamics,** Pomona, Calif. $8,096,310. FY 1966 engineering services for the REDEYE missile system. Pomona. Los Angeles Procurement Dist. Pasadena, Calif.

—**Bauer Dredging Co.,** Port Lavaca, Tex. $1,104,134. Ship channel project at Houston, Tex. Engineer Dist., Galveston, Tex.

—**William McWilliams Industries,** New Orleans, La. $2,380,000. Work on the Ouachita and Black Rivers Projects. Jonesville, La. Engineer Dist., Vicksburg, La.

—**Newall, Inc.,** Waltham, Mass. $1,104,640. Ordnance items. Waltham. Frankford Arsenal, Philadelphia.

23—**Philco Corp.,** Newport Beach, Calif. $1,200,000. Industrial engineering services for the SHILLELAGH missile. Newport Beach. Los Angeles Procurement Dist., Pasadena, Calif.

24—**Bell Aerospace Corp.,** Hydraulic Research Mfg. Co., Burbank, Calif. $1,745,048. Cylinder assemblies for tail rotors for UH-1 aircraft. Burbank. Army Aviation Command, St. Louis.

—**Varo, Inc.,** Garland, Tex. $1,461,950. Periscopes & preproduction evaluation of technical data. Garland. Frankford Arsenal, Philadelphia.

—**Servidone Construction Corp.,** Castleton, N. Y. $1,180,615. Work on the Hop Brook Reservoir Project. Waterbury, Conn. Army Engineer Div., New England, Waltham, Mass.

26—**Hughes Aircraft,** Culver City, Calif. $12,674,886. Research & development on the TOW missile system. Tucson, Ariz.; El Segundo, Calif.; Culver City. Army Missile Command, Redstone Arsenal, Ala.

—**Algernon Blair, Inc.,** Montgomery, Ala. $2,644,183. Construction of a training classroom complex at Fort Jackson, S. C. Engineer Dist., Savannah, Ga.

—**Cayuga Construction Corp.,** New York City. $3,519,025. Work on the Chesapeake & Delaware Canal Project. Wilmington, Del. Engineer Dist., Philadelphia.

—**Hardaway Contracting Co.,** Columbus, Ga., and **Sam Finley, Inc.,** Atlanta, Ga. $15,587,205. Work on lock and dam No. 8 of the Arkansas River and Tributaries Project. Faulkner & Perry Counties, Ark. Engineer Dist., Little Rock, Ark.

—**Martin-Marietta Corp.,** Orlando, Fla. $1,422,203. Special support equipment, spare parts and data to support radio transmitter sets. Orlando. Army Missile Command, Redstone Arsenal, Ala.

—**Industrial Builders, Inc.,** Fargo, N. D. $1,149,864. Work on Gering Valley Project, Gering, Neb. Engineer Dist., Omaha, Neb.

29—**Belock Instrument Corp.,** College Point, N. Y. $1,345,408. Depot maintenance equipment for the HAWK missile. College Point. Army Missile Command, Huntsville, Ala.

—**General Motors,** Pontiac, Mich. $5,584,958. 483 school/ambulance conversion buses. Pontiac and Kosciusko, Miss. Army Tank Automotive Center, Warren, Mich.

—**Markwell & Hartz,** Memphis, Tenn., $1,391,198. Work on Carr Fork Reservoir Project. Hazard, Ky. Engineer Dist., Louisville, Ky.

—**Pace Corp.,** Memphis, Tenn. $1,200,728. Ordnance items. Memphis. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Garrett Corp., AiResearch Mfg. Co. div.,** Phoenix, Ariz. $1,443,700. Research & development on Project MUST—a self-contained transportable medical unit. Los Angeles and Phoenix. Army Medical Research & Development Command, Office of the Surgeon General, Washington, D. C.

—**Chamberlain Corp.,** Waterloo, Iowa. $1,303,185. Ordnance items. Waterloo. Ammunition Procurement & Supply Agency, Joliet, Ill.

30—**Sperry Rand Corp.,** New York City. $6,996,989. Ordnance items. Shreveport, La. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Day & Zimmerman, Inc.,** Philadelphia. $22,486,212. Ordnance items. Texarkana, Tex. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Remington Arms Co.,** Bridgeport, Conn. $9,151,428. Loading, assembling and packing of miscellaneous small arms ammunition. Independence, Mo. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Western Electric Co.,** New York City. $7,110,378. FY 1966 engineering services for NIKE HERCULES and improved NIKE HERCULES. Burlington, N. C., Charlotte, N. C. and Syracuse, N. Y. Army Missile Command, Redstone Arsenal, Ala.

—**Hercules Powder Co.,** Wilmington, Del. $17,241,177. Propellants. Radford, Va. Ammunition Procurement and Supply Agency, Joliet, Ill.

—**U. S. Rubber Co.,** New York City. $13,364,503. TNT and Tetryl, and for reactivation and support of Joliet Army Ammunition Plant, Ill. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**American Dredging Co.,** Philadelphia. $3,444,782. Work on Inland Waterway-Delaware River to Chesapeake Bay Project. Engineer Dist., Philadelphia.

—**Menominee Engineering Corp.,** Norway, Mich. $3,735,134 and $3,735,045. Components for the M-4 military floating bridge. Norway. Army Mobility Center, St. Louis.

—**Universal Match Corp.,** Phoenix, Ariz. $1,038,440. Ordnance items. Phoenix. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Olin Mathieson Chemical Corp.,** E. Alton, Ill. $3,114,475. Ordnance items. E. Alton. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Bell & Howell Co.**, Chicago. $2,127,130. Ordnance items. Chicago. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Telecomputing Services, Inc.**, Panorama City, Calif. $1,104,852. Data reductions services including development of data reduction of techniques, data analysis, data conversion, and digital data processing. White Sands Missile Range, N. M. White Sands Missile Range, N. M.

—**Security Construction Co.**, Richmond, Va. $3,384,000. Conversion of a barrack building to a Bachelor Officer Quarters with mess hall. Fort Benning, Ga. Engineer Dist., Savannah, Ga.

NAVY

1—**Sperry Rand Corp., Sperry Farragut Co.**, Bristol, Tenn. $5,710,425. SHRIKE missiles for the Navy and Air Force. Bristol. Bureau of Naval Weapons.

—**George Hyman Construction Co.**, Washington, D. C. $2,914,998. Construction of a 1500-man dormitory at Bolling AFB, Washington, D. C. Director, Chesapeake Div., Bureau of Yards and Docks.

—**Kaiser Aerospace & Electronics Corp.**, Palo Alto, Calif. $1,845,000. Spare parts for aircraft display systems. Palo Alto. Navy Aviation Supply Office, Philadelphia.

—**Wright Aeronautical Division of Curtiss Wright Corp.**, Wood-Ridge, N. J. $1,-147,393. Aircraft engine spare parts. Wood-Ridge. Navy Aviation Supply Office, Philadelphia.

2—**LTV Aerospace Corp., Ling-Temco-Vought, Inc.**, Dallas, Tex. $95,675,143. A-7A Corsair II aircraft and equipment. Dallas. Bureau of Naval Weapons.

—**McDonnell Aircraft**, St. Louis. $198,600,-000. Production of F-4 aircraft for the Navy and Air Force. St. Louis. Bureau of Naval Weapons.

—**Harmony Tower Development Co.**, Scottsdale, Ariz. $1,757,500. Construction of an aircraft systems training building and enlisted men's barracks at NAS Whidbey Island, Wash. Director, Northwest Div., Bureau of Yards and Docks.

3—**United Aircraft**, Pratt & Whitney Div., E. Hartford, Conn. $5,353,200. TF-30 engines. E. Hartford. Bureau of Naval Weapons.

—**Daniel J. Keating**, Philadelphia. $2,039,-000. Crane tracks drydocks at Naval Shipyard, Philadelphia. Dir., E. Central Div., Bureau of Yards and Docks.

—**International Telephone & Telegraph Corp.**, Nutley, N. J. $2,425,214. TACAN (Tactical Air Navigation) sets for A-7A and CH-46A aircraft. Camden, N. J. Navy Purchasing Office.

—**Raytheon Co.**, Sudbury, Mass. $2,222,000. POLARIS guidance assemblies. Waltham, Mass. Special Projects Office.

4—**Harvell Kilgore Corp.**, Toone, Tenn. $4,-368,100. Parachute flares. Toone. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Amcel Propulsion Co., Celanese Corp. of America**, Asheville, N. C. $6,191,107. Parachute flares. Asheville. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Bendix Corp.**, Mishawaka, Ind. $37,927,-262. Guidance control, air frame and ancillary test sets used with TALOS surface-to-air missile system. Mishawaka. Navy Purchasing Office.

—**Bermite Powder Co.**, Saugus, Calif. $10,-886,957. Parachute flares. Saugus. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Curtiss Wright Corp.**, Wood-Ridge, N. J. $1,465,068. Aircraft engine spare parts. Wood-Ridge. Navy Aviation Supply Office, Philadelphia.

—**United Aircraft**, Stratford, Conn. $1,-874,600. Spare parts for the CH-53A helicopter. Stratford. Navy Aviation Supply Office

—**American Mfg. Company of Texas**, Fort Worth, Tex. $2,896,200. Improvements to production line facilities. Fort Worth. Bureau of Naval Weapons.

—**Sperry Piedmont Co., Sperry-Rand Corp.**, Charlottesville, Va. $1,360,525. Classified Electronic equipment. Charlottesvile. Bureau of Naval Weapons.

5—**Guidance Technology, Inc.**, Santa Monica, Calif. $1,357,081. Components for an attitude indicating system used in aircraft as a safety device. Santa Monica. Navy Purchasing Office, Washington, D. C.

—**Mars Constructors, Inc.**, Honolulu, Hawaii. $1,207,100. Construction of a bachelor officers quarters with mess at the Pearl Harbor Naval Station. Bureau of Yards and Docks.

8—**United Aircraft**, Pratt & Whitney Div., E. Hartford, Conn. $10,000,000. Development testing of the JTF10A-9 aircraft engine. $3,000,000. Design of the lightweight JTF10A-27 aircraft engine. E. Hartford. Bureau of Naval Weapons.

9—**Collins Radio Co.**, Cedar Rapids, Iowa. $2,277,500. Radio sets for use in support of the Army aircraft program. Cedar Rapids. Navy Purchasing Office, Washington, D. C.

$2,684,000. SNAKEYE bomb bodies. Fort

—**American Mfg. Co.**, Fort Worth, Tex. Worth. Navy Ship's Parts Control Center, Mechanicsburg, Pa.

—**North American Aviation**, Columbus, Ohio. $1,239,760. RA-5C Vigilante airframe components. Columbus. Navy Aviation Supply Office, Philadelphia.

—**Johns Hopkins University**, Applied Physics Lab, Silver Spring, Md. $21,286,000. Continued research and development on guided missile systems. Silver Spring. Bureau of Naval Weapons.

10—**U. S. Steel Corp.**, Pittsburgh, Pa. $2,-395,000. Acquisition & installation of production equipment at McKeesport, Pa. Bureau of Naval Weapons.

12—**United Aircraft**, Pratt & Whitney Div., E. Hartford, Conn. $4,415,067. Spare parts used in support of the A-7A (CORSAIR II) aircraft engine. E. Hartford. Navy Aviation Supply Office, Philadelphia.

—**Curtiss Wright Corp.**, Wood-Ridge, N. J. $3,413,207. Aircraft engine spare parts. Wood-Ridge. Navy Aviation Supply Office, Philadelphia.

—**Motorola, Inc.**, Scottsdale, Ariz. $1,652,-961. Radar beacon sets for A-7A and VAL aircraft. Scottsdale. Navy Purchasing Office, Washington, D. C.

—**E. W. Bliss Co.**, Portland, Maine. $1,-361,637. M-21 arresting gear systems to be used with the Marine Corps SATS systems. Portland. Marine Corps.

—**Mite Corp.**, New Haven, Conn. $5,391,500. Teletypewriter sets. New Haven. Marine Corps.

15—**University of California at Berkeley**. $1,-416,000. Research into the basic factors involved in devising and improving methods of defense against potential biological warfare agent. Berkeley. Office of Naval Research.

—**Technical Material Corp.**, Mamaroneck, N. Y. $1,888,462. Radio receivers. Mamaroneck. Navy Purchasing Office, Wash., D. C.

—**Waukesha Motor Co.**, Waukesha, Wis. $1,-175,431. Non-magnetic diesel engines for naval ships. Waukesha. Bureau of Ships.

—**General Electric**, Utica, N. Y. $1,626,200. Radar equipment on E-2A Hawkeye aircraft. Utica. Naval Aviation Supply Office, Philadelphia.

—**United Aircraft**, Hamilton Standard Div., Windsor Locks, Conn. $5,976,573. Propeller systems for P-3A aircraft. Windsor Locks. Bureau of Naval Weapons.

—**United Aircraft**, Pratt & Whitney Div., E. Hartford, Conn. $36,159,200. TF-30-P-3 engines for the Air Force. E. Hartford. Bureau of Naval weapons.

—**Baltimore Contractors, Inc.**, Baltimore, Md. $1,574,000. Construction of foundations & utilities relocation of the science building at the Naval Academy, Annapolis, Md. Dir., Chesapeake Div., Bureau of Yards and Docks.

16—**Western Electric Co.**, New York City. $6,195,200. Oceanographic research. New York City. Navy Purchasing Office, Wash., D. C.

—**Bendix Corp.**, Eclipse Pioneer Div., Teterboro, N. J. $3,707,709. Flight control system components. N. Hollywood. Calif. and Teterboro. Navy Aviation Supply Office, Philadelphia.

—**Norris Thermador Corp.**, Los Angeles. $17,061,000. Bomb bodies. Los Angeles. Navy Ship's Parts Control Center, Mechanicsburg, Pa.

—**Borg Warner Corp.**, Ingersoll Products Div., Chicago. $8,372,160. Bomb bodies. Chicago. Navy Ship's Parts Control Center, Mechanicsburg, Pa.

—**General Electric**, Cincinnati, Ohio. $2,-326,679. Spare parts for J-79 jet engines. Cincinnati. Navy Aviation Supply Office, Philadelphia.

—**United Aircraft**, Sikorsky Aircraft Div., Stratford, Conn. $4,590,629. $3.417,573. Spare parts for initial outfitting of CH-53A helicopters. Stratford. Navy Aviation Supply Office, Philadelphia.

17—**Willamette Iron & Steel Co.**, Portland, Ore. $3,421,000. Activation and overhaul of tank landing ships LITCHFIELD COUNTY (LST-901), PARK COUNTY (LST-1077) and SUTTER COUNTY (LST-1150) located at the Bremerton, Wash., Reserve Fleet Area. Industrial Manager, 13th Naval District.

—**Victor Beauchamp Associated**, Wash., D. C. $3,027,119. $4,719,000. Construction of an operations and technical services building and a general purpose laboratory at the Naval Research Laboratory, Wash., D. C. Dir., Chesapeake Div., Bureau of Yards and Docks.

—**Norris Thermador Corp.**, Los Angeles. $5,674,370. Facilities and support of production of ordnance items. Los Angeles. Bureau of Naval Weapons.

—**Kaman Aircraft**, Bloomfield, Conn. $2,-773,900. Modification of UH-2 SEASPRITE helicopters to a twin engine configuration. Bloomfield. Bureau of Naval Weapons.

—**United Aircraft**, Hamilton Standard Div., Windsor Locks, Conn. $1,704,933. Aircraft propellers and related components for the Air Force. Windsor Locks. Bureau of Naval Weapons.

18—**Sperry Rand Corp.**, Univac Div., St. Paul, Minn. $1,533,554. Computer equipment & services associated with the Navy Tactical Data System. St. Paul. Bureau of Ships.

—**Ets-Hokin Corp.**, Cemsco Div., Wilmington, Calif. $1,190,696. Main switch gears and switchboards for shipboard services. Wilmington, Bureau of Ships.

—**International Telephone & Telegraph Corp.**, Federal Labs, Nutley, N. J. $1,-994,723. Repair parts for radio navigation equipment. Nutley. Bureau of Ships.

—**United Aircraft, Pratt & Whitney Div.**, E. Hartford, Conn. $2,846,151. J60-P-6 engines for T-2B BUCKEYE aircraft. E. Hartford. Bureau of Naval Weapons.

19—**Newport News Shipbuilding & Dry Dock Co.**, Newport News, Va., $3,000,000. Alteration, refueling, submarine safety certification provisions & missile navigation changes for the fleet ballistic submarine USS ETHAN ALLEN (SSBN-608). Newport News. Bureau of Ships.

—**Auto-Control Laboratories**, Los Angeles. $1,126,244. Hydraulic components of test stands used for test of aircraft components. Los Angeles. Navy Purchasing Office, Wash., D. C.

22—**Columbia University**, New York City. $1,760,000. Research in connection with Project ARTEMIS. New York City. Office of Naval Research.

23—**Willamette Iron & Steel Co.**, Richmond, Calif. $1,447,000. Activation and repair of the landing craft repair ship USS ASKARI (ARL-30). Richmond. Industrial Manager, 12th Naval District.

—**General Precision, Inc.**, Librascope Group, Glendale, Calif. $8,794,434. Components for the fire control system for SUBROC. Glendale. Bureau of Naval Weapons.

—**North American Aviation**, Columbus, Ohio. $1,506,810. Classified electronic equipment. Columbus. Bureau of Naval Weapons.

24—**Kollmorgen Corp.**, Northampton, Mass. $1,116,024. Submarine periscopes & associated equipment. Northampton. Bureau of Ships.

—**Radio Receptor Div. of General Instrument Corp.**, Hicksville, N. Y. $2,575,800. Classified electronics equipment. Hicksville. Bureau of Ships.

—**U.S. Steel Corp.**, Pittsburgh, Pa. $18,-997,000. Bomb bodies. McKeesport, Pa. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Northwest Marine Iron Works**, Portland, Ore. $3,396,579. Activation and overhaul of gasoline tankers USS PATAPSCO (AOG-1) and USS KISHWAUKEE (AOG-9). Portland. Industrial Manager, 13th Naval District.

29—**Sewart Seacraft, Inc.**, Berwick, La. $6,477,950. 50 twin-screw, aluminum patrol launches. Berwick. Bureau of Ships.

—**United Boatbuilders**, Bellingham, Wash. $3,916,680. 120 plastic river-patrol boats. Bellingham. Bureau of Ships.

30—**Loadcraft, Inc.**, Denton, Tex. $2,354,608. Fire fighting trucks. Brady, Tex. Navy Purchasing Office, Washington, D. C.

—**Honeywell, Inc.**, Minneapolis, Minn. $2,509,126. POLARIS guidance equipment. Minneapolis. Special Projects Office.

—**U. S. Steel Corp.**, Pittsburgh, Pa. $1,945,000. Bomb bodies. Pittsburgh. Bureau of Naval Weapons.

AIR FORCE

1—**Bell Aerospace Corp.**, Fort Worth, Tex. $2,400,000. Production of UH-1F helicopters & related equipment. Fort Worth. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**International Telephone & Telegraph**, Nutley, N. J. $6,439,907. Electronic countermeasure equipment. Nutley. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Mass.

—**Lockheed Aircraft**, Sunnyvale, Calif. $1,238,275. Work on GEMINI program. Sunnydale. Space Systems Div. (AFSC), Los Angeles, Calif.

3—**Stewart Warner Corp.**, Chicago. $1,598,272. Production of radar altimeters for F-4 aircraft. Chicago. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**General Electric Co.**, Cincinnati, Ohio. $1,794,892. Jettison assemblies for fighter aircraft fuel tanks. Cincinnati. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

4—**Ion Physics Corp.**, Burlington, Mass. $1,003,169. Development of advanced flash X-ray equipment. Burlington. Air Force Special Weapons Center (AFSC), Kirtland AFB, N. M.

5—**Libby Welding Co.**, Kansas City, Mo. $1,006,086. 127 75KVA gas turbine generator sets. Kansas City. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

—**AiResearch Mfg. Co.**, Phoenix, Ariz. $3,016,827. Gas turbine engines. Phoenix. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**American Electric**, Paramount, Calif. $1,315,424. Production of aircraft ordnance. Long Beach, Calif. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**Armco Steel Corp.**, Middletown, Ohio. $1,053,200. Production of metal retaining walls. Middleton. 2750th Air Base Wing, Wright-Patterson AFB, Ohio.

—**General American Transportation Corp.**, Niles, Ill. $3,320,000. Production of aircraft speed brake components. Niles. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

8—**General Electric**, Cincinnati, Ohio. $78,900,000. Production of fan jet engines for the C-5A heavy transport aircraft. Cincinnati. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Panel Corporation of America**, Denver, Colo. $1,145,754. Production of aerial target vehicles for pilot training. Denver. Ogden Air Materiel Area (FLC), Hill AFB, Utah.

—**Talley Industries**, Mesa, Ariz. $1,547,800. Production of aircraft engine starter cartridges. Mesa. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**Lockheed Aircraft**, Sunnyvale, Calif. $1,350,000. Classified services. Sunnyvale. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

9—**General Electric**, Johnson City, N. Y. $5,070,000. Optical sights for F-4 aircraft. Johnson City. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Lockley Machine Co.**, New Castle, Pa. $1,492,401. Production of practice bombs. New Castle. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

—**Goodyear Tire & Rubber Co.**, Akron, Ohio, $1,308,384. Wheel and brake assemblies for C-141 aircraft. Akron. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Continental Aviation & Engineering Corp.**, Detroit. $2,377,835. Classified work. Detroit. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

10—**Honeywell, Inc.**, Hopkins, Minn. $3,400,000. Ordnance items. Hopkins. Aeronautical System Div. (AFSC), Wright-Patterson AFB, Ohio.

—**F. D. Rich Co.**, Stamford, Conn. $4,912,330. Construction of 337 housing units at Beale AFB, Yuba City, Calif. Procurement Office (SAC), Beale AFB, Calif.

—**Lockheed Aircraft**, Marietta, Ga. $22,600,000. Production of C-141 aircraft. Marietta. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

12—**Stelma, Inc.**, Stamford, Conn. $1,720,325. Technical services in support of command-communications systems. Stamford. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Mass.

—**Collins Radio Co.**, Cedar Rapids, Iowa. $1,975,522. Production of components for communications sets. Cedar Rapids. Warner Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**Aircraft Armaments, Inc.**, Cockeysville, Md. $5,721,758. Electronic countermeasures simulator groups. Cockeysville. Rome Air Development Center (AFSC), Griffiss AFB, N. Y.

—**AVCO Corp.**, Stratford, Conn. $1,429,336. MARK 11-A re-entry vehicles. Stratford. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

15—**Boeing Co.**, Seattle, Wash. $1,368,000 and $1,002,000. Modification of early MINUTEMAN missiles. Rapid City, S. D. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Garrett Corp.**, Phoenix, Ariz. $1,473,086. Production of auxiliary gas turbine generators for C-141 aircraft. Phoenix. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Boeing Co.**, Benton City, Wash. $1,349,763. Studies applicable to advanced manned strategic aircraft. Benton City. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

16—**General Precision, Inc.**, San Marcos, Calif. $7,990,210. Navigational Systems for C-141 aircraft. San Marcos. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Hewlett-Packard Co.**, Palo Alto, Calif. $1,424,072. Electronic test sets. Palo Alto. Middletown Air Materiel Area (AFLC), Olmstead AFB, Pa.

—**Lear Siegler, Inc.**, Santa Monica, Calif. $2,470,00. Flight control components for the FIREBEE target missile. Santa Monica. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Olin Mathieson Chemical Co.**, E. Alton, Ill. $1,500,000. Cartridge starters for aircraft engines. Marion, Ohio. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

18—**General Electric**, Cincinnati, Ohio. $1,342,500. Engineering services for J79-GE-11A engines. Cincinnati. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**D-Velco Mfg. Co.**, Phoenix, Ariz. $4,778,465. Cooler systems, aerospace ground equipment and spare parts for F-101, F-102 and F-106 aircraft. Phoenix. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

19—**Fairchild-Hiller Corp.**, Hagerstown, Md. $1,298,262. Production of spare parts for F-105 aircraft. Hagerstown. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

—**AVCO Corp.**, Stratford, Conn. $1,400,00. Special tooling for production of engines for UH-1 Army helicopters. Stratford. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**General Electric Co.**, Philadelphia. $1,192,894. Development & test of space vehicles. Philadelphia. Space Systems Div. (AFSC), Los Angeles.

—**Physics International Co.**, San Leandro, Calif. $1,489,330. Development of an advanced flash x-ray system. San Leandro. AF Special Weapons Center (AFSC), Kirtland AFB, N. M.

—**Atlantic Research Corp.**, Alexandria, Va. $3,042,000. High altitude weather sounding rockets. Gainesville, Va. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**Douglas Aircraft**, Long Beach, Calif. $1,279,395. Ordnance ejector racks for F-105 aircraft. Torrance, Calif. Warner-Robins Air Materiel Area (AFLC), Robins AFB, Ga.

—**Boeing Co.**, Seattle, Wash. $20,175,375. Assembly, installation & checkout of MINUTEMAN missiles for the Grand Forks AFB, N. D. complex. Seattle. Ballistic Systems Div. (AFSC), Norton AFB Calif.

—**Raytheon Co.**, Lexington, Mass. $8,600,000. Air Force Weapons Effectiveness Testing Instrument System. Lexington. Air Proving Ground Center (AFSC), Eglin AFB, Fla.

22—**North American Aviation**, Anaheim, Calif. $2,528,533. Overhaul and repair of components for the HOUND DOG missile. Anaheim. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

23—**Sundstrand Corp.**, Rockford, Ill. $2,516,431. Electric generator alternators for C-141 aircraft. Rockford. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

24—**Sperry Gyroscope Co.**, Great Neck, N. Y. $1,150,000. Flight test program for electronic countermeasure equipment. Great Neck. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**Lockheed Missiles & Space Co.**, Sunnyvale Calif. $6,500,000. AGENA D launch services. Sunnyvale. Space Systems Div. (AFSC), Los Angeles.

—**Sperry Rand Corp.**, Phoenix, Ariz. $1,523,085. Production of components for gyroscope compass systems. Phoenix. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**R.P.R. Construction Co., and Harry M. Rubenstein** (joint venture), Phoenix, Ariz. $4,538,350. Construction of 287 family housing units at Offutt AFB, Neb. Procurement Office, Offutt AFB, Neb.

—**FWD Corp.**, Clintonville, Wis. $3,846,700. Production of 42 fire fighting trucks. Clintonville. Warner Robins Air Materiel Area (AFLC), Robins AFB, Ga.

26—**Applied Technology, Inc.**, Palo Alto, Calif. $6,680,319. Production of aircraft electronic equipment. Palo Alto. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

—**General Electric**, Cincinnati, Ohio. $1,047,227. Research & Development on an advanced turbine engine gas generator program. Cincinnati. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Republic Aviation**, Farmingdale, N. Y. $1,140,706. Modification of F-105 aircraft. Farmingdale. Sacramento Air Materiel Area (AFLC), McClellan AFB, Calif.

29—**AVCO Corp.**, Richmond, Ind. $3,600,000. Fuzes & related equipment for aircraft ordnance. Richmond. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

—**Northrop Corp.**, Norair Div., Hawthorne, Calif. $1,774,365. Installation, operation and maintenance of a BOMARC missile training facility at Vandenberg AFB, Calif. Ballistic Systems Div. (AFSC), Norton AFB, Calif.

—**North American Aviation**, Los Angeles. $1,455,711. Studies applicable to an advanced manned strategic aircraft. Los Angeles. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Ohio.

30—**Boeing Co.**, Wichita, Kan. $1,464,140. Production of components for minor modification of B-52 aircraft. Wichita. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

—**Pioneer Parachute Co.**, Manchester, Conn. $1,760,364. Production of parachutes. Manchester. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

—**Philco Corp.**, Palo Alto, Calif. $2,625,000. Work on satellite control network. Palo Alto. Space Systems Div. (AFSC), Los Angeles.

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FLARE

SEALAB II Report Will Be Feature of Navy's "Man-in-the-Sea" Symposium

"Man's Extension into the Sea" is the theme of a two-day symposium sponsored by the U.S. Navy and six professional societies to be held in Washington, D.C., Jan. 11–12.

The meeting is being conducted in response to an increasing demand for exchange of information on progress by both Government and industry to put man into the sea for longer periods at greater depths.

Secretary of the Navy Paul H. Nitze will lead off the program with the keynote address. Feature papers will be presented by members of the SEALAB II program, including astronaut-aquanaut, Commander Scott Carpenter, Captain George Bond and Captain Walter Mazzone. Inventor-scientist Ed Link will speak on flexible structures for underwater living.

The Navy's SEALAB II experiment began Aug. 27 at an underwater site off the coast of southern California. During a 45-day period three groups of 10 men lived and worked for 15 days each at a depth of 205 feet in a 57-foot long undersea habitat. The aquanaut teams were made up of both Navy divers and civilian scientists. SEALAB II was the second phase of the Navy's "Man-in-the-Sea" program being conducted by the Special Projects Office.

The January symposium will cover many details of SEALAB II such as aquanaut experiences, engineering problems, medical problems, training, logistics, communications, photography, scientific experiments and instrumentation.

Societies sponsoring the symposium are: American Institute of Aeronautics and Astronautics; American Society of Mechanical Engineers; American Society of Naval Engineers; Marine Technology Society; Society of Naval Architects and Marine Engineers; and American Geophysical Union. Navy sponsors are the Office of Naval Research and the Special Projects Office.

Registration fee for the symposium is six dollars, which includes admittance to all sessions and a bound copy of the proceedings. For complete information on advance registration write or call: Ted Evans, the Conference Management Organization, Inc., Colonial Bldg., 105 N. Virginia Ave., Falls Church, Va. 22046. Phone: (Area Code 703) 533–2133.

New AF Mobile Labs Will Speed Photo Processing

A new "semi-dry" processing method which speeds up the development of aerial reconnaissance film has been perfected by the Air Force.

The speedy system will be used in the Air Force's new four-wheeled mobile photographic laboratory units which will probably be in use in Southeast Asia next spring.

The new mobile labs will be capable of processing film enroute from an aircraft to photo interpretation officers, thus speeding up tactical reconnaissance operations.

In the semi-dry process, all developing and fixing chemicals are included in a thin emulsion on a roll of film. When the special film, known as Bimat, is brought face to face with exposed film, complete automatic development takes place in five to 15 minutes.

Use of the system cuts developing time and eliminates the elaborate conventional requirements for water, electricity and chemical waste disposal. In addition, its simplified process does not require the service of skilled photo technicians.